









THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE:

CONDUCTED BY

C. G. BARRETT.

E. C. RYE, F.Z.S.

J. W. DOUGLAS.

E. SAUNDERS, F.L.S.

R. McLACHLAN, F.R.S.

H. T. STANTON, F.R.S.

VOL. XVII.

"In relation to the human mind Nature is boundless ; and though nowhere inaccessible, she is everywhere unfathomable."

HUXLEY.

LONDON :

JOHN VAN VOORST, 1, PATERNOSTER ROW.

1880-81.

248871

LONDON :

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXI.

575-12
E62
INS.

THE

C. V. RILEY,
Washington, D. C.

Entomologist's Monthly Magazine

VOLUME XVII.

We have much pleasure in announcing that with the commencement of Vol. XVII of this Magazine, the Editorial staff will be increased and strengthened by the addition to it of Mr. CHARLES G. BARRETT, who has, from the first, so greatly assisted us, and whose labours in investigating the British Lepidopterous Fauna are so well and favourably known; and of Mr. EDWARD SAUNDERS, who, for many years, has turned his attention to other Orders of British Insects with equally beneficial results.

EDITORS.

1, Paternoster Row, London, E.C. :

15th May, 1880.

A NEW SPECIES OF *LIPURA*.

BY HENRY N. RIDLEY.

This insect I found in April, in the same locality as that of *Machilis brevicornis*, namely, at Water-break-its-neck fall, near New Radnor.

The head is ovate, the antennæ four-jointed, the last joint the largest, and oval in shape. The second segment of the body, *i.e.*, the prothorax, is narrow, the third and the fourth are the broadest, the terminal segment is the smallest. I can perceive no trace of eyes. The last segment bears two short up-curved processes, and the whole body is covered with scattered hairs. The colour of the body is orange, the head and the last segment lighter yellow, the under-side is also lighter in colour, and the alimentary canal seen through the translucent skin causes the middle line of the back to appear darker. The feet and antennæ are snow-white.

Length, $2\frac{1}{2}$ mm.

This little animal differs chiefly from *L. ambulans* (L.) in colour, and also in facies, being broader in proportion to its length, and having the joints of the antennæ more distinctly separate. It lives under stones, moving about very briskly, in spite of its blindness, and the contrast between the orange body and white antennæ and feet makes it an extremely beautiful little insect. All its colour disappears in spirits and it becomes quite white.

I propose for it the name *Lipura aurantiaca*.

20, Portsea Place, Connaught Square :

May, 1880.

A NEW SPECIES OF *MACHILIS*.

BY HENRY N. RIDLEY.

On May 1st, 1879, in an expedition made with the Woolhope Society's Field Club to the waterfall known as Water-break-its-neck, in the Radnor Forest, I captured three specimens of a *Machilis* unknown to me; at that time I had not carefully studied the genus, and so referred them to the species *polypoda* (Linn.), but on further examination I was convinced that the species was new; and having this year succeeded in procuring additional specimens, am enabled to describe it.

The length of the body is 9 mm., and that of the antennæ 4 mm.; the central caudal seta is 8 mm. long. The colour varies somewhat according to age, the adults are brown and metallic, with a thin darker central line on the back, and three irregular dark brown patches on each side. The legs, antennæ, and caudal seta are brown, the latter ringed with paler colour. The younger forms are grey, and more irregularly mottled. None that I have seen are as dark as *M. polypoda*, and most are much lighter. The head is small, the eyes black, and almost touched by the front edge of the prothorax, they meet in the middle line. The prothorax is narrow and cylindrical, the meso-thorax broad and elevated, the meta-thorax narrow, and partially overlapped by the meso-thorax. The segments of the abdomen are nearly equal, and taper gradually towards the tail. The antennæ have a thick basal joint, which is followed by a whip-like portion, composed of numerous small segments, and these, at the extremity, are marked off into three secondary segments, each consisting of five of the smaller segments. The whole is thicker than the antenna of *M. polypoda*, and much shorter, since, in the usual position of rest, when the antennæ are laid back along the sides, they hardly extend to the end of the meta-thorax. The large palpi are composed of six joints, very little (less than 1 mm.) shorter than the antennæ. The second pair of palpi are short and 3-jointed, the last joint being ovate.

The legs are biunguiculate, and the last two pairs bear papilliform processes on the basal joint, corresponding to those described by Sir John Lubbock in *M. polypoda*, and which he supposes to be homologous with the abdominal appendages. The central caudal seta is nearly as long as the body, being 8 mm. in length.

The scales, which I have been able to compare with those of *M. maritima* only, differ from them in their smaller size, and in the greater number of ridges, which vary from fourteen to sixteen in this species, whereas in *maritima* they are generally not more than twelve in number; in *M. polypoda* (Beck, in Lubbock's *Thysanura* and *Collembola*, Ray Society publication) the ridges vary from eighteen to twenty-four. Another distinction may be noticed in the pedicel, which, in this species and *M. polypoda*, projects beyond the base of the scale, but does not do so in *maritima*. The general arrangement of the ribs and cross-bars is the same in all; but I observe in the species now under consideration that in the rounded or ovate scales, which I conclude are the younger forms, the ribs converge to the centre from both sides, so as to form a succession of Vs, with the apex pointing away from the pedicel: this I can find no trace of in the scales of *M. maritima*.

The insect lives under stones in dry places, and always appears rather sluggish, indeed, when the sun was not shining, it did not leap at all, but slowly crept away when disturbed. It appears to be very local, as I only found it in a very circumscribed area, although there were many likely places for it close by. It is by no means easy to find, owing to its colour, and the way it adheres closely to the stone when it is lifted.

I propose for this species the name of *Machilis brevicornis*, in allusion to the shortness of its antennæ, which are shorter than those of any *Machilis* with which I am acquainted, except *M. crassicornis* (Lucas), which occurs in Algeria.

I ought to call attention to the fact that in some features Templeton's figure of *M. polypoda* (Trans. Ent. Soc., vol. i, plate xi) bears a considerable resemblance to this species, but as his figure is so roughly drawn, and as he gives no details nor colour with it, it is impossible to say whether or not he had this species before him.

I should also have mentioned that the insect became of a yellowish-white colour in spirits.

20, Portsea Place, Connaught Square:
May, 1880.

NOTES ON *CRABRO ELONGATULUS*, V. DER LIND., AND THE OTHER BRITISH SPECIES OF *CRABRO* WITH BLACK BODIES.

BY EDWARD SAUNDERS, F.L.S.

Of all our British species of *Crabro*, *elongatulus* seems to have been the cause of the greatest confusion; Shuckard* describes it under seven different names, F. Smith under five. On the continent

* Essay on the Indigenous Fossorial Hymenoptera, 1837.

it seems to have fared better, as Dahlbom,* although he mentions four of Shuckard's species, yet only describes one (*elongatulus*) in full, giving very short diagnoses of the others, two of which he says he has never seen; Wesmael† only describes *elongatulus*, and says that he is disposed to consider all Shuckard's seven species as varieties of it. Thomson‡ also only describes *elongatulus*, but says nothing whatever about its synonymy. Morawitz§ gives *elongatulus* with full synonymy, including all Shuckard's seven species.

There is, I think, little doubt that the view held by the continental authors is correct. I have the good fortune to possess Shuckard's collection of this group, and an examination of it quite bears out their opinion. He only knew the ♂ of *elongatulus*, *luteipalpis*, *proximus*, and *transversalis*, and only the ♀ of *hyalinus* and *obliquus*; of *propinquus* he appears to have known both sexes, but the ♀ only remains in his collection. I have carefully examined all his specimens (*transversalis* he did not possess), and can find no specific difference between the three ♂ or the three ♀; he himself suggests that *luteipalpis* may be a var. of *elongatulus*, and that *proximus* differs from it only in colour, and he also states that he has taken *obliquus* in company with *elongatulus*, and yet it never seems to have occurred to him that they could be ♂ and ♀ of the same species; his primary division of the black species is between those with the "base of the metathorax smooth and shining," and those with the "base of the metathorax striated," and it is this division which has led to all the confusion, as it throws the ♂ into one section and the ♀ into the other. That these ♂ and ♀ belong to each other I think there can be little or no doubt, as they occur together in the same localities, and agree in coloration, punctuation of the thorax, &c., and have been considered as sexes of one species by all the continental authors. Smith has adopted Shuckard's divisions, and therefore comes to similar conclusions as to the sexes, but he gives a ♂ to *pallidipalpis* and to *obliquus*, what these are, his descriptions do not show, as he only gives a few words to each; but, taking everything into consideration, I think that we may with safety agree with the continental authors, and refer all our seven so-called species to one. The following table of our black-bodied species may be useful to some of your readers:

(4) 1. Body petiolated, 1st segment terminating in a node.

(3) 2. Face with a blunt spine between the antennæ, apex of the tibiæ red...

tibialis.

* Hymenoptera Europæa, vol. i, 1845.

† Revue Critique des Hyménoptères fouisseurs, Acad. Royale de Belgique, t. xviii.

‡ Hymenoptera Scandinavie, vol. iii.

§ Crabronides de St. Petersburg, Bull. Acad. Imp. Sciences Pétersb., vol. vii.

- (2) 3. Face without a spine, apex of tibiæ black *clavipes*.
- (1) 4. Body not petiolated, 1st segment not terminating in a node.
- (30) 5. Cheeks beneath without a strong spine.
- (19) 6. Last segment of abdomen in ♂ not more strongly punctured than the preceding, excavated in the ♀.
- (14) 7. Basal area of metathorax not clearly defined.
- (9) 8. Posterior tibiæ very clavate and rounded, without spines or teeth along its outer margin *capitosus*.
- (8) 9. Posterior tibiæ more or less dentate or spinose.
- (13) 10. Metathorax with a wide central channel, which is distinctly margined, front legs of ♂ simple.
- (12) 11. Legs entirely black *leucostoma*.
- (11) 12. Front legs testaceous-brown *pubescens*.
- (10) 13. Metathorax with a simple, narrow, central, impressed line, front legs of the ♂ scutate *cetratus*.
- (7) 14. Basal area of metathorax clearly defined.
- (16) 15. Punctuation of thorax so fine and indistinct as to be scarcely visible, except under a strong power *podagricus*.
- (15) 16. Punctuation of thorax distinct.
- (18) 17. Clypeus black, front legs of ♂ scutate *ambiguus*.
- (17) 18. Clypeus flavous, front legs of ♂ simple *aphidum* = *Walkeri*.
- (6) 19. Last segment of body in the ♂ more strongly punctured than the preceding, not excavated in the ♀.
- (23) 20. Front legs of ♂ scutate, both sexes with the calcaria of the front legs black, or with the clypeus and mandibles yellow.
- (22) 21. Larger, basal area of metathorax large, shining, finely strigose, ♂ tibiæ scutate, clypeus and mandibles yellow *palmaris* = *scutatus*.
- (21) 22. Smaller, basal area of metathorax small, dull, and very coarsely strigose, ♂ tibiæ simple, 1st joint of tarsi scutate, calcaria in both sexes black *palmipes*.
- (20) 23. Calcaria of front legs pale, clypeus not yellow.
- (27) 24. Mesopleuræ spinose.
- (26) 25. Metathoracic area striated *varius*.
- (25) 26. Metathoracic area smooth and shining *exiguus*.
- (24) 27. Mesopleuræ not spinose.
- (29) 28. Thorax more or less shining, punctuation fine but not so very close, tibiæ widely pale at the base, metathoracic area polished and shining in both sexes, rarely finely striate in the ♂ *Wesmaeli*.
- (28) 29. Thorax dull, punctuation very close, tibiæ very narrowly pale at the base, metathoracic area deeply striate in the ♂, striate at the sides only in the ♀ *elongatulus*.
- (5) 30. Cheeks with a strong spine *4-maculatus* (black var.).

I have not included here *Crabro albilabris*, *Panzeri*, or *brevis*, of Shuckard and Smith, as the two former belong to the genus *Lindenius*, and the last to *Entomognathus*; they may all be known from the other black-bodied species by having their ocelli arranged in an isosceles triangle, much widest at the base.

Holmesdale, Upper Tooting :

May, 1880.

ON TWO SMALL CONSIGNMENTS OF *LEPIDOPTERA* FROM THE HAWAIIAN ISLANDS.

BY ARTHUR G. BUTLER, F.L.S.

The following species were received some time since from the Rev. T. Blackburn, but press of work has hitherto prevented me from working them out.

1. *DANAIS ARCHIPPUS*, *Fabr.* (No. 1.)

This specimen somewhat resembles the southern American type in coloration. According to Messrs. Salvin, Godman, and others, it would appear that this is the species intended by Linnæus in his original description of *Papilio Plexippus*, but as he gives China as one of his localities, it seems better to retain a name respecting which there can be no doubt.

2. *PROTOPARCE BLACKBURNI*, *sp. n.* (No. 30).

P. quinquemaculato simillima; major, alis latioribus, magis grisescentibus; signis alarum anticarum subcostalibus albescentibus; serie macularum albarum antice confluentium arcuata discali, cum fascia ordinaria nigrocincta cohærente; fasciola posticarum prima obsoleta; fascia sub-marginali nigra apud apicem multo latiore: alar. exp. unc. 5.

“Occurs rarely near Honolulu.”—T. B.

This handsome species, although nearly allied to the North American insect, is evidently quite distinct; the wings are decidedly broader, the inner margin of the primaries longer and more curved, and the outer margin consequently less oblique; in colour it is greyer, and the light markings are more or less white; the arched double discal belt is represented by two coherent bands, the inner one consisting of confluent, black-edged, lunated, white spots; the white spotting of the fringe is purer, and, consequently, more evident; the sub-basal diffused black band of the secondaries is absent, and the sub-marginal band is broader, being of twice the width at costal margin;

the orange spots on the body decrease more suddenly in size towards the anal extremity, the last spot of the series being of about one-fourth the size of that in *P. quinquemaculata*.

3. *DEILEPHILA LIVORNICA*, *Esper* (No. 2).

Oahu.

This insect came, with some of the succeeding species, all in a more or less broken condition, through Mr. J. B. Blackburn: I have thought it best to include them with the last consignment, as some of them have not been sent home in other collections made by our generous correspondent.

4. *LEUCANIA DISLOCATA*, *Walk.* (No. 6).

Not marked with the exact habitat.

5. *LEUCANIA EXTRANEA*, *Guenée* (No. 63).

"Taken at light. Widely distributed, but rare."—T. B.

6. *PRODENIA INGLORIA*, *Walk.* (No. 9).

Oahu.

7. *CARADRINA VENOSA*, *sp. n.* (No. 8).

C. cubiculari affinis; alis angustioribus, anticis supra pallide fuscis macula orbiculari indistincta, testacea nigro partim cincta; macula reniformi argillacea lineam angulatam albam includente, marginibus nigro punctatis; lineis ordinariis indistinctis, duplicibus, albido impletis, nigris; area externo albo sparsa; signis minutis angulatis submarginalibus nigris; margine externo albido, linea marginali tenui fusca; ciliis albidis fusco intersectis marginatisque; alis posticis margaritaceis hyalinis, venis fuscis; marginibus costali et externo fuscescentibus nitidis; ciliis argenteo albis, linea media indistincta cinerea: thorace fusco, abdomine albido-fusco. Subtus alba, alis nitidis, costis colore arenoso tincta; corpore sordide albo: alar. exp. unc. 1, lin. 1.

"Near Honolulu. Rare."—T. B.

8. *AGROTIS SUFFUSA*, *Gmelin* (No. 55).

Honolulu.

This is quite distinct from the unnamed *Agrotis* previously sent by Mr. Blackburn.

9. *SPÆLOTIS LUCICOLENS*, *sp. n.* (No. 12).

S. pyrophilæ affinis; alis anticis supra pallide arenaceo-fuscae; maculis discoidalibus obsoletis; lineis duabus ordinariis tenuibus nigris, interiore transversa irregulari, exteriore arcuata dentata discali; limbo externo paululum pallidiore introrsum undulato; serie punctorum nigrorum marginali; punctis tribus costalibus nigris; ciliis introrsum testaceis fascia media et linea marginali cinereis; alis posticis pallide cinereo-fuscis area abdominali ciliisque albidis: thorax pallide

fuscus; abdomen arenoso flavidum. Subtus sordide alba; alis nitentibus, punctis marginalibus nigris; anticis nebula discali cinerea; posticis strigula discali ad costam solum distincta cinerea: alar. exp. unc. 1, lin. 9.

Honolulu. "Very rarely, at light."—T. B.

10. *SPÆLOTIS CREMATA*, *sp. n.* (No. 10).

*Affinis S. fugaci, alis anticis cinereis testaceo nebulosis; linea dentato-sinuata duplici nigra albido impleta, aream basalem limitante et furcam sub-basalem introrsum ad costam mittens; costa nigro alboque punctata; macula reniformi maris testacea angulata nigro-cincta testaceo circumcincta, feminae albida testaceo persecta, inconspicua; linea duplici discali nigra, albido impleta, dentato-sinuata; serie macularum albarum nigro introrsum marginatarum submarginali, apud costam angulata; serie punctorum nigrorum marginali; ciliis linea basali testacea; alis posticis fuliginoso-fuscis sericeis, ciliis albis; thorax cinereus rufo strigosus; abdomen fuscum: alis subtus fere velut in *S. fugace*, anticis autem cinereis strigis duabus discalibus maculaque ordinaria cinereis indistinctis: corpus subtus cinereum, pectore albido-crinito: alar. exp. unc. 1, lin. 9.*

♀. *Paulo major, lineis multo pallidioribus rufescentibus: alar. exp. unc. 1, lin. 10.*

♂. "Bred from a pupa found in a sandhill on Maui."—T. B.

♀. Oahu.

11. *HELIOTHIS CONFERTA*, *Walker* (No. 4).

"Bred from larvæ found very rarely in company with that of *Vanessa Huntera*, on flowers of a species of 'everlasting,' on Maui."—T. B.

12. *PLUSIA VERTICILLATA*, *Guenée* (3).

Oahu.

13. *TOXOCAMPA NOCTIVOLANS*, *sp. n.* (No. 64).

Alæ anticæ supra olivaceo-fuscae, cinereo reticulatæ; macula sub-basali triangulari nigra; lineis ordinariis aream mediam leviter obscuram limitantibus tenuissimis albidis nigro-maculatis; linea interiore obliqua, linea autem discali transversa, angulis tortuosis sinuatis; costa nigro-punctata; margine externo apud apicem sinuoso; posticæ cinereo-fuscae, ciliis albis; margine externo sinuoso: corpus olivaceo-fuscum; alæ anticæ subtus cinereæ, linea discali partim distincta; area externa pallidiore extrorsum argillaceo tincta fusco reticulata; margine costali nigro alboque punctata; posticæ albido-fuscae fusco cinereoque reticulatæ; lineis duabus dentato-sinuatis costalibus ferrugineis; area apicali late testacea: corpus subtus roseo-fuscum ventris segmentis cinereo marginatis: alar. exp. unc. 1, lin. 4.

"Flying at dusk, 4000 feet up Haleakala, Maui, two specimens taken."—T. B.

14. *SCOTOSIA RARA*, *Butler* (No. 90).

♂ ♀. "On trunks of trees, Mauna Loa, Hawaii. 4000 feet above sea."—T. B.

The female is darker than the male, but does not otherwise differ in coloration; the antennæ are, of course, simple in this sex.

15. *HYPENA OBSOLETA*, *Butler* (No. 14).

Oahu.

16. *HYPENA INSIGNIS*, *Butler* (No. 14).

Oahu.

These two species (for such I still believe them to be) came in the small series forwarded through Mr. J. B. Blackburn, and previously referred to; unfortunately, they have lost their abdomina.

17. *HYMENIA FASCIALIS*, *Cramer* (No. 25).

Oahu.

18. *SCOPULA EXIGUA*, *sp. n.* (No. 27).

Alæ anticæ supra argillaceo-fulvæ, roseo tinctæ; maculis discoidalibus et linea discali falciformi cinereis; ciliis fusciscentibus; alæ posticæ fuscæ aureo paululum nitentes, limbo costali albo; ciliis albo acuminatis, linea cinerea persectis: corpus supra argillaceo-fulvum, roseo tinctum; ano albido: alæ subtus pallide testaceæ, punctis marginalibus nigris; areis internis ciliisque albis; anticæ linea discali punctisque discoidalibus indistinctis cinereis; punctis duobus tribusve costalibus nigris: corpus subtus album sericeum: alar. exp. lin. 7.

Maui.

Nearer to *S. flavidalis*, of New Zealand, than to any other described species.

19. *SCOPARIA ALTIVOLANS*, *sp. n.* (No. 97).

Alæ anticæ supra fuscæ, paululum sericeæ et aureo tinctæ; macula ad costæ basin obscura, nigro marginata; fascia obliqua pone medium obscure fusca, lineis nigris albo-marginatis limbata, linea interiore angulis alternis irregulari; linea externa angulata; litura discocellulari extrorsum albo marginata introrsum plus minusve diffusa; virgula simili costali; linea discali angulata albida aream externam limitante; costa pone medium albido punctata; serie punctorum nigrorum marginali; posticæ pallide cinereæ; thorax supra fuscus, abdomen cinereum: alæ subtus cinereo albide punctis marginalibus nigris, ciliis ad basin ochreis; anticæ costa pone medium albo punctato; area discoidali obscura; posticæ puncto discocellulari et linea discali cinereis: corpus subtus albido fuscum: alar. exp., ♂, lin. 8; ♀, lin. 9.

“Mauna Loa, Hawaii; 4000 feet above sea.”—T. B.

The male is less strongly marked than the female, but this may be an individual variation, or even the result of abrasion.

Perhaps this species is nearer to *S. sudeticalis* than to any other known species, but it is very different.

REMARKS ON SOME BRITISH *HEMIPTERA-HETEROPTERA*.

BY DR. O. M. REUTER.

(Concluded from vol. xvi, page 175).

In No. 157 (vol. xiv, p. 11) of this magazine, I began some remarks on British *Hemiptera-Heteroptera*, which I will now finish. I have only to make some corrections of my previous remarks, and to reply to several objections made by Mr. Douglas to different points of my observations.

PENTATOMA BACCARUM, E. M. M., xiv, p. 11. Mr. Douglas's remarks concerning the nomenclature of this species are quite correct, and I am obliged for the elucidation he has given. However, I still think *P. fuscispina*, Boh., is a good species, and different from *nigricornis*, Fabr.

NEIDES PARALLELUS, l. c., p. 12. Mr. Douglas admits this species to be only an imperfectly developed form of *N. tipularius*, Linn.; but he says that it can hardly be termed brachypterous, "for it has fully developed elytra, the wings only being short:" still, I think that the term "brachypterous" may be employed in this case. The dimorphism is here of the same kind that Dr. Sahlberg has named "cryptodimorphism" (Reut., Ann. Soc. ent. de Fr., sér. v, t. 5, p. 233), the brachypterous form having the elytra only a little shorter, or, at least, with narrower membrane, than the macropterous, but the wings always much shorter, and the pronotum posteriorly narrower and less convex. The membrane in *N. parallelus* is not "fully developed," being much narrower than in *N. tipularius*.

SCOLOPOSTETHUS ERICETORUM, l. c., p. 13. Mr. Douglas thinks this species is not *decoratus*, Hahn. This opinion has, however, not been approved either by Dr. Puton or by Dr. Horváth; and I also must continue to hold my concurrent opinion. The figure 71 of Hahn (Wanz. Ins., i, p. 139), can never be regarded as representing any other species than *ericetorum*. All the legs are black, the antennæ black, with the exception only of the *extreme base* of the second, and the extreme apex of the first joint. These are just the characters of *ericetorum*, which also often has the first joint of the antennæ quite black. The figure given by Hahn can nowise represent *affinis*, which has the first joint of the antennæ quite red, or only toward the base black, and the second joint only in its apical half black, and the rest red, or sometimes almost entirely red. In *affinis* only the anterior legs

are black, the intermediate ones being red, and the hind legs also red, or with a black ring before the middle. This is Hahn's "Abänderung c," under which the description of Schilling is cited verbatim: "*antennis basi rufis, pedibus pallidis, femoribus anticis nigris.*" On the contrary, the description of the type of Hahn gives the following characters: "Fühler schwarzbraun, das erste Glied derselben am Ende und das zweite am Grunde röthlichgelb: die Füße röthlichgelb, *alle Schenkel*, mit Ausnahme der Spitze derselben, *schwarz.*"*

ORTHOTYLI, with green cell-nerve and somewhat diaphanous shining elytra. In my remarks on these species (No. 159; vol. xiv, p. 60), some typographical errors are to be corrected. Line 17, from below, p. 60, for "the first joint," read "the third joint;" p. 61, line 7, from above, for "somewhat sharply," read "not;" and, the same page, line 19, for "head," read "third."

By examining a greater quantity of material, I have reduced the British species to the following:—

- 1 (2). First joint of antennæ, beneath, with a black streak.

O. stricornis, Kirschb.

- 2 (1). First joint of antennæ unicolorous.

3 (4). First joint of antennæ as long as the head; second joint with some longer exserted very fine hairs, the last two joints together shorter than the second; third joint a little less (♂) or a little more (♀) than twice shorter than the second; fourth joint as long as the first, and less than twice shorter than the third. Vertex distinctly carinate. The genital segment of the ♂ scarcely broader than the other, and as long as the five preceding segments together. $5\frac{1}{3}$ — $5\frac{1}{2}$ mm.

O. viridinervis, Kirschb.

- 4 (3). First joint of antennæ shorter than the head, second joint without exserted longer hairs.

* According to this discrimination, the synonymy will be:—

DECORATUS, Hahn.
ericetorum, Leth.

AFFINIS, Schill.
decoratus, Abänd. b and c, Hahn.

I had, however, cited (Brit. Hem., p. 183, the Abänd. b and c as = *adjunctus*, D. and S., and I still think so, at any rate, with respect to the former. The Abänd. b is described: "Das erste und zweite Fühlerglied ganz und das dritte zur Hälfte, nebst den Schenkeln des zweiten und dritten Fusspaares, röthlichgelb," exactly agreeing with *adjunctus*: the Abänd. c seems to be merely the brachypterous form of b, but in view of the appended verbatim description of *affinis*, that species may be indicated. In any case it is agreed that *adjunctus*, D. and S., and *affinis*, Schill., are good distinct species—as species are now reckoned.

If, as Dr. Reuter says, Hahn's figure 71 cannot be regarded as representing any other species than *ericetorum*, yet it will have to be admitted that for this both the figure and description are in some points unsatisfactory. Thus, Hahn says that the antennæ are stronger than in *S. pictus*, and they are so represented; that the first joint at the end and the second at the base are reddish-yellow, and the figure shows them largely so; but in *ericetorum* the antennæ are not stouter than in *pictus*, and the light colouring of the first and second joints is pale yellowish (not reddish-yellow), and of very slight extent on either, and, as Dr. Reuter says, the first joint is sometimes wholly black. All the thighs are said to be black, except at the apex (the figure does not show the base), but in *ericetorum* the second and third pairs are longly reddish-yellow at the base, in all the British and foreign examples I have seen. Lastly, Hahn says his *decoratus* is found under moss at the foot and on the roots of "Fichten und Föhren," which stand at the sides of woods: whereas, with us, *ericetorum* is found exclusively among heather (*Calluna*), and mostly where no fir-trees grow.—J. W. D.

5 (8.). Anterior legs, beneath, without long bristly hairs. The elytra without intermixed fuscous hairs. The eyes of ♂ not very large and convex. Vertex not, or very indistinctly, carinate.

6 (7.). Fourth joint of antennæ scarcely twice, or a little less than twice, shorter than the third, and distinctly longer than the first. The genital segment of ♂ broader than the preceding ones; the forceps very large, the right lobe bidentate, on the left lobe the teeth very long-produced *O. prasinus*, Fall.

7 (6.). Fourth joint of antennæ twice (♂), or more than twice (♀), shorter than the third, and scarcely (♀), or very little, longer (♂) than the first. The genital segment of ♂ scarcely broader than the others; the forceps moderate, the right lobe bidentate, with the teeth short, almost equal *O. Scotti*, Reut.

8 (5.). Anterior legs, beneath, with a series of long, pale, bristly hairs. Hemelytra often (especially in the ♂) with rather numerous intermixed fuscous hairs. Vertex carinate, in the ♂ almost narrower than the very convex, prominent and large eye. Eyes, in ♂, above, approaching each other. Antennæ (especially in ♂) rather robust, very densely and finely fuscous-pubescent; third joint only one-seventh or one-eighth (♂), or one-fifth to one-fourth (♀) shorter than the second, and two and one-third—almost three times—longer than the fourth; fourth joint as long as, or scarcely longer, than the first. Genital segment of ♂ small.

. *O. diaphanus*, Kirschb.

GLOBICEPS FULVIPES, *l. c.*, No. 171. In vol. xv, p. 66, I have given the differential characters of *fulvipes*, Reut., and *flavomaculatus*, Fabr., Reut., but now, in reading the descriptions of the British authors, I find that *fulvipes*, Saund. (= *flavomaculatus*, Dougl. and Scott) cannot be referred to *fulvipes*, Reut. Messrs. Douglas and Scott say (Brit. Hem., p. 365): "Corium: * * disc with a large pale yellowish-white triangular patch," while the ♂ of *fulvipes*, Reut., has only an external, mostly *very small*, and often scarcely distinct, white spot. Examining the descriptions, and also the figures, drawn and coloured by Fieber, I find also that there really exist three very closely allied species in Europe.

1. GL. SELECTUS, Fieb. (= *flavomaculatus*, Fall., F. Sahlb., Reut.). Vertex of ♂, *as far as to the margin*, convex; the margin in the middle carinate, carina *arcuate*,* the front very convex. Head of ♀ very globose, vertex emarginate, seen from the side, very convex, and *highly raised* above the eyes. Last two joints of antennæ paler. Eyes of ♂ and ♀ *remote* from the pronotum. Pronotum at the base about two and a-half (♂), or almost two-thirds broader than at the extreme apex before the calli; the calli in ♀ *very elevated*. Corium, behind the base, with a large triangular whitish patch, which, at the apex, is *emarginate*. The right forceps at the apex incurved, not, or scarcely, to the right, but to the left, almost at a right angle, and much prolonged; the prolongation with the margins almost parallel, the upper margin near the apex with small teeth.

* The carina rarely reaches almost to the inner margin of the eye; but in this case the species is also distinguished by the convex vertex, and by the eyes being remote from the pronotum; lastly, by the different structure of the right forceps. It is possible that the British specimens (described as *flavomaculatus*, by Douglas and Scott) are to be referred only to this variety, and not to the following species.—O. M. R.

2. GL. FLAVOMACULATUS, Fabr., Fieb., Dougl. et Sc. (?), = *fulvipes*, Saund. (?), = *cruciatus*, Reut.!: Vertex of the ♂ *almost flat*, margin carinate, the carina toward the eyes more obtuse and *curved*. Head of ♀ with the vertex convex and *rather slightly raised* above the eyes. Eyes in the ♂ *scarcely remote* from the pronotum. Pronotum at the base two and a-half to two and two-thirds (♂), or almost twice as broad as at the extreme apex before the calli; the calli in ♀ *very elevated*. Corium behind the base with a large triangular *truncate* whitish patch. The right forceps in ♂ irregularly heart-shaped (*cordatus*), the right lobe shorter and broader, the left lobe longer, and with the margins almost parallel, the whole upper margin of the forceps (in the middle angular-emarginate), especially in the right lobe, with numerous small teeth.

3. GL. SALICICOLA, n. sp. (= *fulvipes*, Reut., nec Scop., nec Saund., = *flavomaculatus*, var. 1, F. Sahlb.): Vertex of the ♂ *flat*, the elevated margin *straight*, as far as to the inner margin of the eyes, vertex, before this margin, at each side with a transverse impression, front very *declivous*. Head of ♀ *slightly raised* above the eyes. Eyes in the ♂ *not remote* from the pronotum. Pronotum at the base two and two-thirds (♂) or almost twice (♀) as broad as at the extreme apex before the calli; calli in ♀ *low*, in ♂ *scarcely elevated*. Corium behind the base with a *small exterior* whitish spot, or wanting this marking (♂), or with a rather large* triangular *truncate* patch (♀, very rarely in ♂). Right forceps of ♂ large, irregularly triangular with acute angles, the left more acuminate and curved, the upper margin toward the angles with small teeth.

I name the first species *selectus*, Fieb., and the second *flavomaculatus*, Fabr., Fieb. From the short description of Fabricius, it is not to be elucidated which of the two species he has described; and I think it is, therefore, just to retain the nomenclature employed by Fieber, the first author, who has separated them. This is more probable because Fabricius indicates "Germania" as the country for his species, and both species occur there. In the north of Europe, is found only *selectus*, the *flavomaculatus* of Scandinavian and Finnish authors belonging to this species. Not having observed that Fieber's *flavomaculatus* differed from my *salicicola* (*fulvipes*, olim), I described the former species as new, under the name *cruciatus* (Öfvers. Finska Vet. Soc. Förh., xxi, p. 36, 10).

I have changed the name *fulvipes* to *salicicola*. *Cimex fulvipes*, Scop. (Ent. Carn., p. 134, 388), which I had before identified with *flavomaculatus*, Fieb., cannot be regarded as a *Globiceps*. Scopoli says in his description: "Niger; elytris corio fusco, basi apiceque albo; pedibus fulvis," and further: "Antennæ basi [= first joint] fulvæ. Alæ hyalinæ. Femora postice compressa." The ♀ is described: "Larva nigra; antennis *fulvis*, apice *nigris*; elytro abbreviato, coriaceo, albo; fascia nigra; pedibus fulvis." This description somewhat

* Smaller than in the preceding species.

accords with my *Globiceps*, but the elytra are indicated as 3 *lin. long*, and the species is said to live on nut-trees ("in *Corylo*"). In Carniola occurs *very plentifully*,* a species (found also in Silesia on oak), viz., *Allæonotus distinguendus*, H.-Schf., Fieb., Hem. Eur., p. 262, and I am convinced that this is the true *Cimex fulvipes*, Scop.; it must, therefore, to my mind, be named *Allæonotus fulvipes*, Scop. This is the reason for the change of the name *Globiceps fulvipes* to *Gl. salicicola*. A female of this last species was found by me on small *Salices*, near Culbin Sands, at Forres, Scotland, in the summer of 1876. It lives in Finland on *Salix rosmarinifolia* and *Betula nana*.

ACANTHIA *versus* *SALDA*, *l. c.*, No. 188; vol. xvi, p. 172. I think Mr. Douglas has given good reasons for his opinion on the nomenclature of these insects: the name *Salda* may be employed for Fabricius' *Acanthia zosterae*, *flavipes*, etc., and the name *Acanthia* be adopted for *Cimex lectularius*, Linn.

SALDA *MARGINELLA*, H.-Schf. (D. et S., Catal., 54, 10), is only the male of *S. saltatoria*, Linn. The sides of the pronotum are straighter in the ♂ than in the ♀.

SALDA *VESTITA*, E. M. M., vol. xvi, p. 173. I had regarded this species as being a variety of *S. pallipes*, but this is not correct. I have now examined specimens sent by Mr. Douglas to Dr. Sahlberg, and found that the species belongs to the line 2, *l. c.*, p. 174: "the anterior tibiæ with the base and apex black, and in the middle a rather short line." After a careful examination and comparison with specimens found by me in Scotland, I am sure that *Salda vestita*, is not a variety of *S. saltatoria*, as Saunders regards it, but that it is the *macropterous form* of *S. stellata*, Curt. (*c-album*, Fieb.).† The markings of the elytra are the same, and the sides of the pronotum are straight, especially in ♂. I found three specimens in company with *stellata*, brachypt., which is very common in Scotland. In the macropterous form, the pronotum is wider posteriorly, on account of the expansion of the muscles of the wings. (The most part of the species of *Salda* are crypto-dimorphous, having the elytra and wings of the brachypterous form, yet not shorter, sometimes a little longer, than the abdomen).

* "Laibach, inter Rakik et Zirknitz, inter Adelsberg et Prevald frequenter, inter Klana et Sabizhe." Reuter, Verh. zool.-bot. Ges. in Wien, 1875, p. 85, 52. A large number of specimens, captured by Dr. Palmén.

† It seems necessary to say that the identification of *S. c-album*, Fieb., with *S. stellata*, Curt., depends not only on the description, but on actual comparison with the type in Curtis's collection. —J. W. D.

SALDA PILOSELLA, Thoms. According to Mr. Douglas (Ent. M. M., xvi, p. 218), this species is regarded by Dr. Puton as only a pilose form of *S. pallipes*, but I think *S. pilosella* is a good species. It often occurs in company with *pallipes*, but it can at once be distinguished from it. The colour is very little variable; the bristly erect hairs of the head, pronotum, scutellum, and clavus seem to me to be good differential characters.

S. ELEGANTULA, Fall., is regarded by Dr. Puton (*l. c.*, p. 218) as the brachypterous hispid form of *S. cincta*, H.-S., but this cannot be approved. I have examined, in the Museum at Helsingfors, a *macrop-terous* specimen of *S. elegantula*, having the elytra covered with black bristly hairs, and the antennæ are distinctly thicker than in *cincta*.

SCOLOPOSTETHUS PILOSUS, Reut., is suspected by Dr. Puton (*l. c.*, p. 219) to be only a hispid variety of *S. affinis*, which latter is found by us only on nettles; while *S. pilosus* lives in damp places among fallen leaves, moss, &c.

Helsingfors: 11th March, 1880.

NOTES ON UNKNOWN OR LITTLE-KNOWN LARVÆ OF MICRO-LEPIDOPTERA.

BY E. L. RAGONOT.

(continued from Vol. xvi, p. 273).

Platytes cerussellus, S. V.

The larva is unknown, but Anton Schmid once bred the moth from an unobserved larva in moss. The moth is fond of grassy banks and ditches, and flies abundantly in June and July.

Crambus alpinellus, Hb.

Larva unknown, the moth flies on dry sandy pasture lands, where heath, broom, and *Artemisia campestris* grow, in July and August. It is not an alpine insect, nor does it specially frequent fir woods.

C. verellus, Zk.

According to Anton Schmid, the undescribed larva feeds in moss on the branches of old plum, apple, and poplar trees, but Dr. Rössler finds the moth also in fir woods where the ground is covered with moss. The moth flies in July and August.

C. dumetellus, Hb.

The larva is unknown, the moth occurs on dry hill-slopes in June and July.

C. ericellus, Hb.

The moth, whose larva is unknown, flies on moors and heaths in alpine countries, and also in fir-woods where the sandy soil is moss-grown, in July and beginning of August.

C. silvellus (a), Hb., *adipellus*, Tr.

Larva unknown. The moth flies on boggy or damp mossy meadows, end of June, July, and August. Hübner's name has the priority. Treitschke imposed a new name, because there was already a *Tinea* bearing the name of *sylvella*, but as the modern classification places the two insects in very different families, and as it is generally admitted that two insects may bear the same name if in very distinct genera, even if they belong to the same group, the name given by Hübner must be maintained.

C. hamellus, Thnb.

The larva is unknown, and the imago is fond of sandy heaths among firs, and flies in July and August.

C. pascuellus (a), L.

Larva unknown, the moth flies commonly in June and July, in damp meadows, woods, and moors.

C. uliginosellus, Z.

Larva unknown, the moth flies in boggy meadows in June and July.

C. furcatellus, Zett.

The larva is unknown. An alpine or northern species which frequents grassy mountain slopes in July and August.

C. margaritellus, Hb.

The moth flies commonly in June, July, and beginning of August in damp boggy meadows or woods. Larva unknown.

C. myellus, Hb., *conchellus*, Tr.

The larva has been described by Treitschke, but as he confounded *myellus*, Hb. with *conchellus*, S. V., it would be desirable to have a fresh description. The larva would feed, according to Treitschke, in galleries under moss on stones in March. The moth appears in June and July, and affects the borders of woods.

C. latistrius, Hw.

The moth is fond of dry sandy localities on the coast, and inland among heath, and flies in July and August. The larva is unknown.

C. perllellus, Sc.

Larva is still unknown. The moth flies in damp meadows from the end of May to August, and even in September. Koch supposes that there may be two broods.

C. warringtonellus, Stt.

This is considered a variety of *perlellus*; it flies in the same localities as the type in July and August.

C. fascelinellus Hb., *aridellus*, Z.

The larva feeds on the roots of *Triticum junceum* and other grasses, for the moth occurs as well inland in dry sandy districts as on the coast. I mention this species here because it has been confounded with *spuriellus*, H.-G. (*pedriolellus*, Dup.), which is quite a different species and found only in the Alps. M. Guenée (*Annales Soc. Ent. de France*, 1843 Bull. p. xli) describes *fascelinellus*, and the mode of living of the larva, under the name of *pedriolellus*, Dup., hence no doubt the error which has crept into the "Manual."

C. inquinatellus, S. V.

The moth has been bred by Schmid from an unobserved larva on *Barbula muralis*. The moth flies in dry fields and heaths, end of July and in August.

C. cantaminellus, Hb.

The larva is unknown, the moth flies in dry fields in July and August.

C. culmellus, L.

The moth flies abundantly in fields from June to August, but the larva is unknown.

C. craterellus (*rorella*, L.).

The larva is unknown, the moth is common in dry fields and pasture lands, from the end of May to July.

C. cassentiniellus, Z.

Is, I think, rightly considered to be only a variety of the preceding species.

C. lithargyrellus, Hb.

The larva is unknown, the moth flies in dry sandy places and heaths in July and August.

Eromene ocella, Hw.

Larva unknown, the moth flies in June, but the earliest captures of this species in England were in early spring (March), showing that the insect hibernates. Mr. Sydney Webb met with a fresh specimen at Folkestone on the 4th August, 1879.

Schœnobius mucronellus, S. V.

The larva is undescribed, but is stated to feed in stems of reed (*Arundo phragmites*) in June, the moth appears in July.

Observations on the last moult of the larva of Stauropus fagi.—Though the earlier moults of this curious larva have been described as occurring with comparative ease, and observed to occupy no more time than from ten to fifteen minutes, or at most half an hour for the penultimate moult, there yet remains the *last* moult for me to offer some account of, which happens at night, and is altogether a much more protracted and exhausting operation.

Specially for this purpose the Rev. Bernard Smith, of Marlow, kindly provided me in the seasons of 1876—77 with several examples of the larva, feeding on beech, but with each of them in turn I unluckily failed to witness the last moult, from my inability to continue on the watch sufficiently late at night.

However, thanks to another generous friend, the season of 1879 brought a further opportunity with a larva of *fagi*, feeding, this time, on oak, very kindly presented to me by Mrs. Hutchinson, of Leominster, and this was destined to compensate for my previous mischances, as eventually I was able to see the whole of the last moult, to my great satisfaction, and bring the larva to maturity.

It was on the 3rd of September when I happened to notice the larva had fixed itself midway between the leaves on an oak twig, in preparation for its last change of skin; whereupon I placed the twig standing erect in a short bottle having a very small neck, and then, by cutting away the lower leaves from the twig, secured an unobstructed view of the larva, which had probably been so fixed thereon all the previous day, as it already had a double headed appearance, from the real head being mostly within the skin of the second segment; it was grasping the twig with the four pairs of ventral legs and all the front segments were stretched arching backwards over the erected broad segments of the tail, thus forming a more or less circular position.

Occasionally, though at long intervals, the fore parts of the body would be gently raised up and down a little, sometimes varied with a kind of convulsive heave, and once, after many hours' stillness, the anterior legs were extended laterally to their utmost stretch, quite rigid for a couple of minutes and were then gradually refolded; quite late at night the tail segments hung down a little but soon were erected again.

Next morning and throughout the day the first pair of ventral legs and the second pair partly, sometimes wholly, were withdrawn from the twig, the hold of the larva being sustained then by the third and fourth pairs which brought the head down lower than before on one side or the other of the tail; as night drew on all the anterior legs were outspread to their utmost.

In early morn of September 5th, I beheld it in the same posture as in the previous night, though about noon the head was even still lower, and with the fore part of the body turned away a little on one side from the tail, and in course of the afternoon suddenly changed over to the opposite side; thus, with slight variation of detail, for the remainder of the day and evening continued the wonderful exhibition of muscular power and endurance.

At 10.35 p.m., the larva seemed getting restless and continued to swing itself partly round on the twig, still in the same circular posture, and in a minute or two swung back again, and then commenced, gently at first, writhing backwards and downwards, soon with increasing energy; the anterior legs having lately been folded together now began to alternately relax outwards and contract again inwards close to the body, in what soon became a regular recurring rhythmic movement in unison with

the heavings of the breast, until within twenty-five minutes of the event expected, when suddenly most violent writhings and rapid twistings ensued for the space of two or three minutes, and then the slower measured movements were resumed; the skin enveloping the head became glistening and throbbed in parts with a slight inflation, in accord with the general heaving action of the larva; presently a series of very violent struggles occurred with the anterior legs extended laterally; these efforts proved effectual, for then at 11.35 p.m. the expected moment came, when the skin suddenly burst all round the throat, as it seemed then to be, close to the old head-piece.

Immediately there appeared a transverse yawning rent, exposing the whitish head and tender glistening bases of the short first pair of legs, held back at the moment by their sheathing of old skin, which drew quickly from off them, when they fell forward in their natural position; the same measured heaving to and fro movement continuing with incessant energy as the old skin (rapidly blackening) drew back and next exposed the basal joints of the second or longest pair of legs, whose long femurs were soon uncovered, yet before their tibiae were freed the third pair of legs being a little shorter and of unequal lengths, were drawn out from their sheathing and slipped forward, first one, the shorter of the two, then the other, and next were liberated the tibiae and tarsi of the long second pair, all playing immediately after in unison with the whole body which now unbending sustained its hold of the twig by one ventral leg only of the fourth or hind pair, and while the old skin glided backwards by degrees the other ventral legs were in turn slowly stepping out as it were of their old stockings, at this time the long front crustacean-like legs began impatiently to play about and push at the old head-piece as cleverly as arms and hands, to weaken the attachment and free the mouth parts, and from them the old helmet fell away just as the second pair of ventral legs were uncovered.

Meanwhile the hinder segments of the body had become drawn out straight and narrowly cylindrical though tapering, the caudal filaments drawn close together forming apparently but one projecting point which now with the hinder portions of the body became elevated almost perpendicularly, as the fore parts with the head and anterior legs were lowered in contact with the mouth of the bottle, evidently feeling for the leaf which had been previously cut away as before mentioned, the third pair of ventral legs were next uncovered and then one of the fourth pair, when as the moment approached for the only supporting leg to let go its tenacious hold of the twig, I instantly held a silk handkerchief round the neck of the bottle just as the leg was removed and the old skin drawn back from it, and then the larva lay sprawling and trembling on the mouth of the bottle as the shrivelling skin drew off from the eleventh segment, and after a few efforts to hold itself on the bottle slipped off upon the soft surrounding material, whereon for two minutes it remained perfectly still, and made the first pause from incessant motion established so long; refreshed with this it then turned partly round and vigorously thrust and pushed with its mouth and arm-like legs at the old collapsed skin on the twelfth segment which soon became freed excepting the caudal filaments hidden within the retreating skin: now it lay at full length with the hinder segments slightly turned aside, all the ventral legs sprawling, the anterior ones extended forward in freedom, motionless, sleeping apparently for fourteen minutes, and then vibrated the front legs a little, slowly turning the head round, threw out the longest pair of arm-like legs beyond the head, one bent partly over the other like a tired out athlete enjoying repose in

perfect abandonment; for there seemed something very human in the expressively weary attitudes assumed while it again stretched itself with a slight change of position and slept for four minutes more; it then awoke and shook the tail segments which yet remained comparatively narrow, when suddenly the exuviae fell away disclosing the two perfect filaments; thus at 12.50 a.m. was this moult completed, having from the rupture of the skin to this final riddance occupied one hour and a quarter.—WILLIAM BUCKLER, Emsworth: *May 5th*, 1880.

Insects in Japan.—It is very evident I shall have little time for correspondence as spring comes on, and summer follows, as I have been almost entirely engaged in collecting and setting this month, although the greater part of it has been a series of storms of rain or snow. I have already got much material, but nothing grand yet. I found *Panagæus rubripes* and *Leistus laticollis*, which were wanting to my cabinet before, and I have about 7 new *Geodephaga*, all obscure species. From Hakodate, I have 4 or 5 others, and *Cychnus convexus*, given to me by a Japanese, so I have no doubt the *Cychnus* is common up there. I have made arrangements to be taken in at Hakodate on the 1st July, for 2 months. *Sympiezocera* is out here now and feeds in rotten *Cryptomeria japonica*. The *Hemiptera* are evidently abundant, as I have carded about 60 species and seen others. *Carabi* are not out yet; I have only seen 2 specimens—1 *insulicola* and the common species. *Damaster* should be about now, I hear, but it requires search at night and is troublesome to get.

Japan is disappointing in many ways, one cannot eat the food of the natives and this involves taking "chow-chow" with you everywhere, a great impediment and expense for portorage. I have a passport for the 13 adjacent provinces and can go anywhere I like, but the idea of exhausting the Nipon-fauna must be abandoned—the country teems with species in every quarter—and it is too much for one person.

About 13 species of hibernated butterflies are seen in the warm parts of sunny valleys, and I shall get a few later.

Fusiyama must be seen to be appreciated; no wonder the Japanese pray to it. I am going up on to the plains on which its base rests, about the 15th of next month, for some early spring things and then again in June.

Nikko is the great place every one says for beauty, insects and primeval forests, it is 90 miles north of Tokio (no one speaks of Yedo now): we go to Nikko in June for 2 weeks before going to Yezo.

Rosalia Batesi, Har., is common here, in Yezo and Sikoke, and so is distributed evidently. Yokohama is the worst place in Japan for an Entomologist, you cannot get away from it under 4 or 5 miles, and then you find yourself close to some beach or other, no road takes you comfortably inland amongst moist woods and vegetation.

I was working at old pine "stools," as Turner called them, all yesterday with a heavy hatchet.

The *Elaters* are already just under the bark and will come out with the first burst of spring.

There are numbers (in species) of *Trichoptera* about, but they require too delicate handling to admit of preservation.

About 10 days ago I got some nice things at Mionoshta, a place in the hills 30

miles off. You can put your hand into the hill-side amongst the ferns and shrubs, and burn your fingers in the scalding water, or look down and see steam in jets mingling with the water-falls: the baths there are much frequented.—GEO. LEWIS, Grand Hotel, Yokohama: *March 27th*, 1880.

Note on Coniopteryx lutea, Wallengren.—This little-known species was described by Wallengren in his *Skandinaviens Neuroptera*, pt. i, p. 55 (1871). It possesses ample posterior-wings, and is thus allied to *tineiformis* and *aleyrodiformis*, but it especially differs in the neuration of the anterior-wings, the second sector being absolutely simple, whereas the first ends in two forks; moreover, there is a transverse nervule from near the beginning of the first sector to the second, and it is also larger, and the mealiness is described as yellowish-grey. He says two examples from Gothland are in the Stockholm Museum.

I have before me two examples of *Coniopteryx* that agree perfectly with the description, excepting that the mealiness can scarcely be termed yellowish; it is possible the original examples may have been discoloured by age. One of these is from Kuusamo in East Bothnia, Finland; the other from Hautaika, district of the Yenesei (68°. 5 N.), North-western Siberia. Both taken by Dr. J. Sahlberg. They are larger than even *C. psociformis*. The antennæ are 24-jointed (Wallengren says *about* 25-jointed). This is evidently a boreal species, but there is no reason why it should not be found in Scotland.—R. McLACHLAN, Lewisham, London: *15th May*, 1880.

Elipsocus cyanops, Rostock, a species new to Britain.—Mr. J. E. Fletcher recently forwarded to me an example of this insect, one of three beaten by him from *Pinus sylvestris*, at the Old Hills near Worcester on August 13th, 1877, and June 10th, 1878. The species was described by Rostock, firstly in the *Entomologische Nachrichten*, vol. ii, p. 192 (1876), and secondly in the *Jahresb. Ver. Naturk. Zwickau*, for 1877, p. 99, from examples taken in Saxony. It is somewhat smaller than *E. Westwoodi* and *E. hyalinus*, and readily distinguishable by the body being wholly yellow, excepting the black (bluish in life, according to Rostock) eyes and ocelli, the antennæ (excepting at the base) and the tibiæ and tarsi being more obscure. The wings are wholly hyaline with dark neuration and a yellowish pterostigma. It is most likely to be mistaken for *Cæcilius obsoletus*, but the 3-jointed tarsi at once distinguish it therefrom, the intermediate joint being apparently longer and more distinct than in *E. Westwoodi* and its ally.

Probably it is the insect that Hagen identified somewhat doubtfully with *Hemerobius flavicans*, Linné, *Fauna Suecica*, ed. ii, p. 384. No doubt *flavicans* represents some species of *Psocidæ*, but it cannot have been *cyanops* from the words "*Caput nigrum. Thorax nigricans*" (in the diagnosis the words are "*niger, thorace abdomineque flavis*"). I have types of *E. cyanops* before me.

There is yet work to be done in British *Psocidæ*, notwithstanding that most of the known European species have been detected here.—ID.

Corrections of Errors.—In my note on "Parthenogenesis in *Tenthredinidæ*," &c., vol. xvi, 269, two errors of nomenclature occur. For "*Nematus miliaris*" read "*Nematus curtispina*, Thoms.," and for "*Nematus pallidus*" read "*Nematus palliatus*, Thoms."—J. E. FLETCHER, Worcester: *May 14th*, 1880.

ON *MUSCA HORTORUM*, FALLÉN, AND ALLIED SPECIES.

BY R. H. MEADE.

It has been well said, that an Entomologist who aspires to be anything more than a collector or dabbler in science, must confine himself to the study of one Order of insects; and if he has but little time at his disposal, devote most of his attention to one family in that Order: he can only thus acquire an intimate and critical acquaintance with the characters of the species which it contains, or of their life history.

In many genera there are small groups in which the species bear such a close general resemblance to each other, that several species have been confounded together by the older authors. This has principally arisen from their neglecting to observe and record minute points of structure, such as the number and disposition of the hairs and spines on the legs, wings, or body of the insect; which are often exceedingly valuable specific characters, being mostly constant, and, not liable to vary like size and colour.

The descriptions of the older Entomologists were also generally so brief, that they often apply equally well to two or three distinct species, and there is very little doubt that they frequently were so applied; the author confusing two or three species. Much learning has sometimes been brought to bear on this subject, in the endeavour to ascertain the precise species to which a name has been applied; but if this point can be cleared up at all, it must be by the examination of typical specimens preserved in Museums.*

It is to one small group in the restricted family of *Muscidæ* that I wish to direct attention. In our gardens and groves, and on the road-side hedges, a very common fly may be found of a blue-black colour, marked with white reflections, rather larger than the ordinary house fly (*Musca domestica*), which has been long known as the garden fly (*Musca hortorum*). Upon careful examination it will be found that two distinct species (both common in most places in England), have been confounded by all the older Dipterologists, and are still but imperfectly known, different authors who have distinguished them having described them by different names, in ignorance of the writings of others; so that the synonymy is in great confusion.

Robineau-Desvoidy, in his great work upon the Myodaires, published in 1830, first pointed out that there were several distinct species

* Meigen's collection of *Diptera* is in the Jardin des Plantes, in Paris; Macquart's in the Museum of his native city, Lille; Fallén's is in Stockholm.

in this group, and he made a new genus for their reception, which he named *Morellia*; he failed, however, to characterize the different species satisfactorily, and it was our own countryman Haliday who, retaining R. Desvoidy's generic name *Morellia*, first clearly separated the two common species which had been previously confounded. His account will be found in the Entomological Magazine for 1836. Macquart had previously (in 1833) described a well-marked smaller species in his "Diptères du nord de la France," which he named *curvipes*;* and he also noticed that there was another resembling *M. hortorum*, but he only noticed slight differences in colour, and copied R. Desvoidy's descriptions, which were too vague to be of any value. Dr. H. Loew fully described both the common species as well as another in 1857, and Professor Rondani also gave an account of them in 1862; but none of the authors I have mentioned agree as to the names which they give to the two common species, nor which of them should retain Fallén's original name. Walker, in the "Insecta Britannica," ignored Haliday's paper, only giving one species; and, as the descriptions of the latter author in the Entomological Magazine are very brief, and not now generally accessible, I hope it may not be without interest if I endeavour to describe the four species now included in R. Desvoidy's genus, and try to clear up the synonymy.

The larvæ of the two common species have been found in cowdung.

Genus MORELLIA, R. Desv.

Eyes naked, arista plumose, fourth longitudinal vein of wing bent outwards towards the third, in a rounded curve, so as nearly to close the first posterior cell, which terminates a little before the apex of the wing; posterior or discal transverse vein placed midway between the anterior or little cross vein and the centre of the curve of the fourth longitudinal vein. Shining blue-black flies, striped and tessellated with black and white, with the antennæ, palpi, and legs black. The species in this genus are coloured and marked in a very similar manner to *Aricia albo-lineata* (one of the *Anthomyiidae*), with which they must not be confused.

The species may be thus distinguished:

- A. Hind metatarsi with a cushion of short stiff hairs on their under surfaces, but not bearded, and hind tibiæ straight, or only slightly curved.
- B. Middle tibiæ without a basal tubercle in the males.
- C. Hind tibiæ straight, fore tibiæ simple.

Sp. 1—SIMPLEX, Loew.

* This species has not been recorded as British, though it is not uncommon in England.

CC. Hind tibiæ of males slightly curved, fore tibiæ ciliated.

Sp. 2—HORTORUM, Fallén.

BB. Middle tibiæ of males with a bristly tubercle at the base.

Sp. 3—PODAGRICA, Loew.

AA. Hind metatarsi of males with a thick beard in addition to the cushion, and with hind tibiæ much curved.

Sp. 4—CURVIPES, Macquart.

1. SIMPLEX, LW. ♂ ♀. *Cærulo-chalybea nitida*; thorax antice vittis tribus latis albidis; abdomen tessellis albidis, linea dorsali, maculisque indeterminatis nigricantibus; ♂ oculis sub-coherentibus, tibiis posticis subrectis, intus medio longe ciliatis; tibiis anticis intus nudis; alulæ, squamis inferioribus infumatis; alæ hyalinæ, venis longitudinalibus tertiis, basi setulosis (♂ ♀); ♀ oculis quartario capitis separatis; pedibus simplicibus; alulis albidis. Long. $2\frac{1}{2}$ — $3\frac{1}{2}$ lin.

SYN.—*Musca hortorum*?, Meigen, System. Besch., v, 73. *Cyrtoneura hortorum*?, Macq., Diptères du nord de la France, 148, and Ins. Dipt., ii, 276. *Cyrtoneura hortorum*, Rondani, Dipt. Ital., v, 213. *C. simplex*, Loew, Wiener entom. Monatschr., i, 45; Schiner, Fauna Austr., i, 596. *Morellia hortorum*, R. Desv., Dipt. des environs des Paris, ii, 636; Haliday, Entom. Mag., iv, 149. *M. importuna*, Haliday, Ann. of Nat. Hist., ii, 185.

Colour dark glossy black-blue: head black; ♂, eyes separated by a narrow black space contracted in the middle, where the eyes are almost contiguous. ♀, eyes separated by a space measuring one-fourth of the width of the head; ♂ ♀, sides of face glistening silvery-white, with black reflections; antennæ not quite reaching epistome, third joint twice the length of second, of a grey colour; arista thinly furnished with long hairs, which leave the apex bare for some length; palpi black, epistome slightly prominent, setigerous; facial groove bordered with bristles; cheeks clothed with short black hairs: thorax with three longitudinal, broad, glistening white stripes, most distinct on the front margin; the lateral stripes irregular in shape, and only extending backwards as far as the base of the wings; between the white stripes are two indistinct black ones on each side: abdomen of a glistening greyish-blue colour, sometimes with a glaucous tinge; it has a longitudinal black dorsal stripe, and is tessellated with black and white spots or rather reflections, which show differently when viewed in different aspects: legs with fore femora clothed in ♂ with soft short hairs along their outer sides, and ciliated in ♂ ♀, beneath with long stiff bristles of nearly equal length, placed at equal distances from each other like the teeth of a comb; fore tibiæ naked on their inner sides, and having only a row of short even hairs on their outer and under surfaces; middle femora with a few long stiff bristles on their upper sides near the tip, and with some long hairs on the under surfaces near the base; middle tibiæ evenly ciliated along their outer sides with a row of very short hairs; hind femora clothed along their exterior and under surfaces with long hairs, something similar to those under

the fore femora ; hind tibiæ nearly straight, slightly thickened in the middle, beset with bristles of unequal lengths on their outer sides, having a few long hairs on the lower half of their under surfaces in ♂ and ♀, and also a few long soft hairs on their inner sides, just below the middle in ♂ ; hind tarsi with a cushion of short stiff bristles of a brownish-yellow colour on their under surfaces : alulets with the upper or smaller valves half white and half grey, and the lower and larger ones of an uniform smoky-brown colour in ♂, with a yellowish marginal fringe, and dirty white in ♀ : halteres yellow : wings clear, with black veins ; third longitudinal vein with a small tuft of bristles at its base in ♂ and ♀, some of which extend a short distance towards the small cross vein.

This species is generally distributed throughout Europe ; it is less common than the next in most parts of England and Ireland (Haliday), and also in Germany, but more general in Italy and probably in France.

It is very difficult to decide to which species to apply Fallén's original name, as modern authors differ so much on this point. Haliday, whose opinion is worthy of every respect, changed his mind upon the subject. In his original paper in the Entomological Magazine, in which he first pointed out the distinctive characters between this and the following species, he named the one I have first described *hortorum* ; but in the second volume of the Annals he said that he was mistaken, and believed that the next species which he had before named *importuna* was the true *hortorum* of Fallén. I have already said that I have no doubt whatever that Fallén, Meigen, Zetterstedt,* and others, confused two species together, so that it matters little which of the two retains the original name ; I have therefore concluded to follow Loew, the greatest modern authority on Dipterology, who gives the name of *hortorum* to that species which appears to be most common in the north of Europe.

2. HORTORUM, Fall. ♂ ♀. *Glauco-chalybea nitida*. Thorax et abdomen ut in *M. simplicie signata* ; ♂ oculis paulo distantibus ; femoribus anticis subtus extraque barbatis ; tibiis anticis extra spinosis intusque villosis ; femoribus mediis apice cristatis ; tibiis posticis leviter curvatis, intus breviter villosis ; alulis sordide albidis ; alis, venis longitudinalibus tertiis, setis parvis armatis, ordine positis, inter basem venæ et venam transversam parvam. ♀ oculis tertia parti capitis separatis ; pedibus simplicibus.

Long. 3—4½ lin.

SYN.—*Musca hortorum*, Fallén, Act. Holm. (1816), 252, 33, et

* Zetterstedt, in Dipt. Scand., describes his *Cyrtoneura hortorum* as having the eyes in ♂ "coherentes (non vero arctissimi)," et "libiæ omnes rectæ"—both these characters apply to *M. simplex* ; but he adds, "squamæ albæ," et "femora antica extus in ♂ villosa"—both of which apply to *M. hortorum*.

Dipt. Suec. Muscid., 52, 33 ; Wiedemann, Zool. Mag. (1817), i, 183 ; ? Meigen, System. Besch., v, 73 ; Zetterstedt, Insect. Lappon., 660 ; Walker, Insect. Brit., ii, 113. *Cyrtoneura hortorum*, Zetterstedt, Dipt. Scand., iv, 1346 ; Loew, Wien. ent. Mon., i, 46 ; Schiner, Faun. Austr., 1, 596. *C. pilipes*, Rondani, Dipt. Ital., v, 215. *Morellia importuna*, Haliday, Ent. Mag., iv, 149. *M. hortorum*, Haliday, Ann. Nat. Hist., ii, 185. *M. agilis*?, R. Desv., Myod., 405. *Alina agilis*, R. Desv., Dipt. envir. de Paris, ii, 639.

Colour and pattern the same as in *M. simplex*, but the abdomen has more frequently a green tinge: head—eyes of ♂ parted by a black space, which occupies about one-eighth of the width of the head, and is about twice as wide as the interval between the eyes of *M. simplex*; the space between the eyes of ♀ measures one-third of the width of the head, characters of the other parts of the head similar to those of *M. simplex*: thorax and abdomen marked as in *M. simplex*: legs with fore femora ciliated beneath with long stiff hairs, in addition to which (in the ♂) they are thickly bearded on the outer and under sides with soft hairs; fore tibiae of ♂ with a few long stiff spines on their outer surfaces near the middle and at the extremities, and with their inner sides clothed along the whole length with thick, soft, and rather short hairs; middle femora armed in ♂ with a tuft of short but stiff bristles near the tip; middle tibiae with a series of short erect little spines, placed irregularly along the upper half of the outer surface, and having the lower half of the same surface fringed with soft short hairs, as in *M. simplex*; hind femora with only a few long hairs on their under surfaces near the ends; hind tibiae slightly but distinctly curved inwards at their lower thirds, they have a thick row of short stiff bristles along their outer sides, and only a few short soft hairs on their inner and under surfaces; hind tarsi as in *M. simplex*: alulets dirty white, lower scale in ♂ having a brown tinge in the form of a ring, near the margin, the edge itself being fringed with pale yellow: wings clouded near the base with brown, which colour is conspicuous in the small basal cells: third longitudinal vein armed with six or seven small spines, which are arranged along the vein at nearly equal distances, and extend from the base to near the small cross vein in ♂ and ♀.

This species is rather larger than the former, and very common; the males may at once be distinguished from those of the preceding species by the tuft on the apex of the middle femora, by the wider space between the eyes, and by the anterior tibiae being hairy on their inner sides instead of the posterior ones, as in *M. simplex*; also by the spines on the wings. The females of the two species (which authors have failed to discriminate) may most readily be known from each other by the difference in width between the eyes, by the hind tibiae in *M. simplex* being clothed beneath with a few long hairs (which are absent in *M. hortorum*), and by the different armature of the third longitudinal veins of the wings.

3. PODAGRICA, LW. ♂. *Nigro-chalybea nitida, lineata et irrorata*

ut in *M. simplex*; *oculis sub-contiguïs*; *pedibus anticis ut in M. simplex armatis*; *tibiis intermediis tuberculo hirsuto basi posito*; *tibiis posticis paulo curvatis, et extra ciliatis*; *alis subfuscis*; *alulis obscuris*.
Long. 4—5 lin.

SYN.—*Cyrtoneura podagrica*, Loew, Wien. ent. Mon., i, 45; Schiner, Dipt. Austr., i, 596.

♂. Colour shining dark blue-black, without any tinge of green: thorax and abdomen marked as in the two preceding species, but having the latter less tessellated with white: head as in *M. simplex*, the eyes near together, though not contiguous: legs, fore femora ciliated with a comb-like row of bristles on their under surfaces, as in *M. simplex*; fore tibiæ nearly bare; middle legs armed as in *M. hortorum*, and also with a bristly tubercle seated on the outer side of the head of the tibia; hind tibiæ a little curved, clothed with long soft hairs on their outer sides: alulets with the lower scale of an uniform brownish-yellow colour: wings tinged with brown at their bases and along the fore borders, the longitudinal veins also a little clouded; the third longitudinal vein armed at the base with a few spines, as in *M. simplex*: the ♀ is unknown to me.

This fly has not yet been found in Britain, but inhabits lofty mountains in Germany, where it is said to be not uncommon. It is the largest species in the genus, and is of rather a darker colour than the others; I have not seen a female, but my friend Mr. Kowarz, of Franzensbad, kindly sent me a male specimen.

4. CURVIPES, Macq. *Cæruleo-nigra nitida*; *thorace albo-lineato et abdomine cinereo-tessellato*; ♂ *tibiis posticis valde arcuatis*; *metatarsisque posticis barbatis*; *femoribus intermediis subtus in basi spinula erecta armatis*; *tibiisque intermediis inclinatis*. *Long. 2½—3 lines.*

SYN.—*Cyrtoneura curvipes*, Macq., Dipt. du Nord., 148, et Insect. Dipt., ii, 276. *Cyrtoneura curvipes*, Zett., Dipt. Scand., iii, 1347; Rond., Dipt. Ital., v, 215. *Camilla ænescens*, R. Desv., Dipt. env. de Paris, ii, 641.

This species varies a good deal in colour, it is less brilliant and less distinctly striped and tessellated than either of the preceding ones, though marked in the same manner; there is often a greyish, and sometimes an æneous tinge on the abdomen, and the thorax is less blue than black; the ♂ has the eyes somewhat widely separated; the fore femora are ciliated beneath as in *M. simplex*; the fore tibiæ simple; middle femora armed beneath at their bases with a single long strong spine, and with a few long bristles on their outer and under surfaces near their apices; the middle tibiæ have an angular bend in the middle, the lower halves being directed outwards, they are also ciliated along their whole outer surfaces with little stiff rough spines, similar to those seen in *M. hortorum* and *M. podagrica*; the hind femora are evenly clothed along their whole under surfaces with hairs of a moderate length, and have a tuft on their upper surfaces near the base; the hind tibiæ are rather long and strongly curved inwards; they are bare on their inner sides, with

the exception of two long, slender, curved bristles on each tibia near the apex; the outer surfaces are armed with spines of uneven lengths; the hind metatarsi, in addition to the usual cushions, have beards of strong, long, black hairs on their under surfaces, partially extending to the other joints of the tarsi: alulets nearly white: wings in some specimens tinged at the base and along the fore border with brown, in others clear; the third longitudinal vein is armed with a few little spines arranged in a row, as in *M. hortorum*: the ♀ is not known to me.

This well-marked little species is not uncommon in England, though rather local; I have received specimens from Mr. B. Cooke, of Southport, and have found the males plentifully near Bicester in Oxfordshire; I have not yet met with the female. Macquart and R. Desvoidy say that it is common in France; Rondani has found it frequently in Italy; Zetterstedt says that it is very rare in Scandinavia; and its capture has not yet been recorded in Germany, to my knowledge.

Bradford, Yorks :
May, 1880.

NATURAL HISTORY OF *BOTYS PANDALIS*.

BY WILLIAM BUCKLER.

Hitherto the early stages of this species have remained in profound obscurity, and now that I have become familiar with them I can understand why the larva, from its mode of life, had never been detected; therefore, my pleasure is all the greater in being able to render an account of it, which I owe to the discernment and kindness of my friend Mr. W. R. Jeffrey, of Ashford, who, on the 13th of June, 1879, captured a female *pandalis*, and with hope of obtaining eggs confined her in a jam-pot, together with leaves of several *Compositæ* and *Labiatae*, yet not an egg was deposited on any of them.

However, two days later Mr. Jeffrey found several eggs had been laid on the inside smooth surface of the pot and five more on its piece of plate-glass cover, looking for all the world like splashes of moisture that should be wiped off at once, but the next moment with keen intuition he knew they were *ova*; and though wishing to send some directly to me, he afterwards very wisely resolved not to risk forwarding the piece of glass, but to pay attention to them and their produce himself, till they were fit to travel, and to furnish me with his observations, which here follow.

"When first laid on 14th and 15th June the eggs were flat, scale-like, but more translucent than any I have observed, like minute drops of fluid or oil; under the microscope the shell is seen to be reticulated

and beautifully iridescent; on the fifth day the embryo was distinctly visible, on the eighth day the ocelli could be seen, on the tenth the mandibles plainly, the segmental divisions and dorsal canal slightly, and on the twelfth day the black head and plate on the second segment showed most plainly, indeed, the slow undulating movement in the alimentary canal could be distinctly traced; about 10 o'clock the same night, June 27th, they began to hatch, and the little larvæ were all out of the shells before next morning.

"The colour of the larva when first hatched is creamy-white with black head and plate. Fortunately I had growing plants of *Solidago virgaurea*, *Origanum vulgare*, and other species, from which I at once gathered leaves to see what they would take as food; but at first they were too restless, crawling upward and trying to escape from under the glass cover of the pot; but next day I noticed one larva had attacked a leaf of *Solidago* by eating a small hole partly through it; subsequently other leaves were similarly eaten into, and by the beginning of July they evidently preferred the golden rod and marjoram."

With this account Mr. Jeffrey kindly forwarded to me a dozen of the larvæ on the 3rd of July, just as they had completed their first moult, and were then not quite a tenth of an inch long, having a glossy black head and collar-plate, a whitish pellucid skin, bearing blackish-brown dots, and a broad yellowish-green internal vessel showing through.

On the 8th of July I found they had moulted for the second time and become less transparent, excepting the belly which remained much as before though slightly yellower, while the body above was darker and rather dingy green, the head, the plate and dots shining brownish-black.

They lived contentedly but well apart from each other, and when preparing for the third moult spun little hammock-shaped silk webs on the under-side of the leaves, or between leaves slightly uniting the surfaces.

After the third moult, on July 17th, I was at first astonished at not seeing the larvæ, until I became aware that they were inhabiting little *cases*, which they had made for themselves with portions cut from the leaves of their food plants; some of the cases were lying loose among the leaves, though one or two at first were still adhering to the leaves by a small part not cut away; on turning out a larva two days later I saw its back and sides were deeply tinged with dark purplish-brown.

Henceforward the larvæ were not easily observed, as they were

exceedingly shy, never protruding their heads to feed during the day unless in darkness and perfectly undisturbed; they evidently fed well, and made fresh cases whenever they required roomier abodes or those in use changed colour from decay; indeed, the leaves of *Clinopodium*, *Origanum*, and *Solidago*, from which they constructed them, were not of a nature to last long in a good condition; it therefore seemed probable that in complete liberty the larvæ would use any more suitable leaves for case making they might happen to find; and to test this idea I introduced some leaves of beech with their food, and they were not slow to appreciate this better material, as one larva after another constructed a new residence, and before long they were all occupying cases cut from beech.

On one occasion I chanced to surprise a larva, three parts grown, lying along the midrib on the upper surface of a beech leaf, engaged in spinning a great number of silk threads, close together and parallel, from one side to the other as a foundation for a new case,—I had only just observed this, and that the sides of the leaves were drawing upwards, when I was called away for a little while,—and on my return found a large oval piece of the leaf the size of a pigeon's egg had been neatly cut out and drawn closely together at the edges into a well fashioned elongate, plump, pasty-like case, having a circular hole of egress at both ends; all the cases were of similar form, and varied but little in size after the last were made, nearly an inch long by almost three-eighths across the broad middle.

Latterly, indications appeared of some of the larvæ being nearly or quite full-fed, as I found some cases attached by silk threads to the marjoram and basil, when I added a few leaves of *Teucrium scorodonia*, and this the few still feeding appeared to relish so much as to care but little for their previous diet; all but one were full fed by 9th of September, and that last one on the 19th: they had moored their cases, destined for puparia, to some of the neighbouring leaves with threads of brownish silk; and one hole of each case had disappeared by the edges being drawn closely together, the other hole evenly plugged up with silk; in one instance the case was strongly moored near either end across the under edge of a beech leaf from which a large oval piece had been cut away as material for a similar construction, an interesting example Mr. Jeffery gave me to figure.

Most unexpectedly, when I chanced to look into their cages on the 16th of November, I found in one a ♀, apparently just out of pupa, and in another found a second ♀, equally perfect, while at the bottom lay a dead ♂ specimen partly discoloured.

This season, 1880, I bred a male specimen rather crippled on May 27th, and this afternoon a fine female, the remainder no doubt retarded by ungenial weather.

The full grown larva is seven-eighths of an inch in length, of moderate slenderness, cylindrical, though tapering very little from the fourth segment to the head, and again only at the end of the thirteenth, all are plump and well defined, with a transverse wrinkle across the back of each; the ventral legs shortish, the anal pair extending behind: the colour of the back and sides as far as the spiracular region is very dark grey tinged more or less with purplish-brown, the dorsal line still darker, the glossy head of the same dark colour is marked with black in front of each lobe, a black glossy plate dorsally divided with dark grey is on the second segment, and on either side of the third and fourth are two faintly paler longitudinal lines gradually lost beyond them, the tubercular spots large, black, and glossy, each with a fine hair; below the small round black spiracles the whole surface is rather light greenish-grey or drab and the spots there are brownish-grey.

The pupa is half an inch long, rather slender, of pyraloid character, with the back of the thorax and abdominal upper segments very slightly keeled, the head parts moderately produced, the wing covers long and well defined, the tapering hind part of the abdomen having a flattened taper prolongation and blunt extremity, furnished with minute curly-topped bristles; in colour dark purplish-brown with the lower abdominal divisions golden-brown, the wing covers glistening, all the rest glossy.

Emsworth: June 5th, 1880.

DESCRIPTION OF THE SPECIES OF *MACROPIS*.

BY W. H. PATTON.

MACROPIS CILIATA, n. sp.

♀. Length, $\frac{4}{16}$ to $\frac{5}{16}$ in., expanse, $\frac{9}{16}$ to $\frac{10}{16}$ in. Black; the head closely punctured, and having a thinly scattered short white pubescence; mandibles piceous at the tip; flagellum beneath fulvo-testaceous, a short fringe of hair on the inner side of the scape; the eyes in freshly-killed specimens of a dull green, with varying longitudinal stripes or spots. Thorax closely punctured, the base of the metathorax very minutely punctured and not shining, pubescence on the sides of thorax and beneath, as also a line on each side of the scutellum, white, the pubescence on disc of thorax very short and thin; wings sub-hyaline, shaded at apex, tegulæ and nervures black, stigma piceous. Apical joint of all the tarsi dark piceous, joints two to four of the anterior and three and four of the intermediate tarsi fulvous, joints two to four of the posterior tarsi pale testaceous; a ferruginous stripe on the intermediate tarsi beneath, and a stripe of white hairs on the intermediate tibiæ and base of the first

joint of the intermediate tarsi above. Posterior tibiæ, except the glabrous enclosure at base, and the basal joint of the posterior tarsi, except at tip, clothed externally with white pubescence, that on the basal joint of the tarsi beneath fuscous; claws yellow at the base; calcaria pale testaceous, those of the posterior tibiæ arising close together. Abdomen shining, delicately punctured; a little white pubescence at the base, very delicate continuous white fasciæ at the base of segments two to five, visible only when the abdomen is extended, a narrow white fascia at the tip of the third and fourth segments, widely interrupted on the third segment, and scarcely interrupted on the fourth; the fimbria on the fifth segment white. The glabrous enclosure on the sixth segment black or piceous, and with a smooth border. The apical margins of the ventral segments testaceous, and clothed with griseous pubescence.

Numerous specimens taken at Waterbury, Conn., on the flowers of *Lysimachia ciliata*, from July 3rd to 22nd; of *Rhus glabra*, from July 22nd to August 7th; and of *Archangelica hirsuta*, August 14th.

Var.—The base of metathorax without punctures and shining, the tegulæ dark piceous.

One specimen taken at New Haven, Ct., on the flowers of *Rhus typhina*, July 2nd; and one specimen taken at Waterbury, Ct., on the flowers of *Lysimachia ciliata*, July 22nd.

Var.—Differs from the preceding variety in having the tegulæ testaceous.

Two specimens taken at New Haven, Ct., on the flowers of *Rhus typhina*, June 21st.

Var.—No hairs on the clypeus, tegulæ dark piceous, base of metathorax without punctures and shining, scutellum fringed behind with griseous hairs, the ferruginous stripe under the intermediate tarsi not extending upon the first joint, basal joint of posterior tarsi with fuscous hairs externally upon its apical half, the white fasciæ upon the abdomen obsolete, the fimbria mostly fuscous, and the apical margins of the ventral segments dark piceous.

Two worn specimens taken at Waterbury, Ct., on the flowers of *Lysimachia ciliata*, together with a specimen of the typical form, July 17th.

♂. Length, $\frac{5}{16}$ in., expanse, $\frac{1}{8}$ to $\frac{11}{16}$ in. Antennæ nearly as long as the head and thorax; flagellum fulvo-testaceous beneath; the scape entirely black, with a fringe of white hairs on each side, and with shorter hairs in front; second joint of the flagellum narrowed at base, and scarcely longer than the first, third joint scarcely one-half the length of the second, as thick as the apex of the second, joints four to eleven each equal in length to joints two and three taken together, but not so thick as the third joint, last joint a little longer than the eleventh. The face below the insertion of the antennæ, and a spot at the base of the mandibles, yellow; labrum black; pubescence on head and thorax longer than in the female, white; thorax shining, punctured, base of metathorax polished and without punctures; tegulæ testaceous; nervures and stigma testaceous; pubescence on legs white, that on the

basal joint of all the tarsi beneath, as well as a line under the four anterior tibiæ, golden-rufous; apical joint of all the tarsi dark piceous, joints two to four paler; posterior coxæ with a short curved spine at the tip, within; posterior tibiæ sub-triangular, the lower face produced at the apex into a three-toothed process, the exterior tooth the longest, and forming a spine, the middle tooth shortest, blunt; calcaria whitish, the point of the anterior calcaria not so long as in the female, the posterior calcaria unusually remote, arising from the bases of the outer teeth of the process, the exterior tooth about two-thirds the length of the corresponding spur; the lower face of the basal joint of the posterior tarsi flattened, expanded within and glabrous. Abdomen shining, clothed with a scattered white pubescence, which is more dense on the sides, the depressed apical margins of the segments polished, the apical margins of the third and the four following segments with a narrow white fringe, that on the third segment interrupted, on the fourth slightly interrupted. Abdomen beneath very smooth, the apex of the third and fourth segments with a single, slightly arcuated, row of golden hairs, the end of each hair regularly curved; the apex of the fifth segment with a similar, but less regular, row of hairs; the visible portion of the sixth segment forming an angle with the concealed portion, triangular, the two posterior sides margined with a short dense golden pubescence. The exterior clasps of the forceps expanded and deeply emarginate at the tip.

Described from five specimens taken at New Haven, Ct., on the flowers of *Rubus villosus*, June 22nd; and one specimen taken at Waterbury, Ct., on the flowers of *Cornus paniculata*, July 4th.

MACROPIS PATELLATA, *n. sp.*

♂. Differs from *M. ciliata*, ♂, in the following particulars:—

Joints five to twelve of the antennæ each slightly shorter than joints three and four taken together, making the antennæ as a whole slightly shorter than in *ciliata*. Labrum yellow. Base of the tibiæ with a yellow spot externally, which, in the posterior legs, extends upon the tips of the femora. Ciliation of the ventral segments white. The process at the apex of the posterior tibiæ represented by the exterior tooth only, forming a stout, obliquely-truncated, projection, reaching to the middle of the exterior spur; the calcaria not so remote as in *ciliata*; the lower face of the basal joint of the posterior tarsi slightly sinuous within, but not expanded. Exterior clasps of the forceps broadly cleft, forming two narrow lobes. The retracted ventral segments present other distinctions.

Taken by Mr. H. F. Bassett on the flowers of either *Cicuta* or *Rhus* at Plymouth, Ct., August 1st; and by me on *Lysimachia ciliata* at Waterbury, Ct., July 9th.

A female specimen taken with the males differs from the typical females of *M. ciliata* in no respect, except that the fimbria on fifth segment of abdomen has a golden tinge and the tegulæ are dark piceous.

As the males of *ciliata* and *patellata* differ in those characters only which are peculiar to that sex, it seems not unlikely that the females,

which present no such development of characters as the males, may be undistinguishable. The males must be considered typical of the species. But it may be that the first form of the ♀ described above, under *ciliata*, belongs in reality to *patellata*, for in ♂ *patellata* the base of the metathorax, although it is not opaque, is not so brilliantly polished as in ♂ *ciliata*.

Fabricius, in describing *Megilla labiata* and *fulvipes*, gave no differences between them, excepting such as are now known to be sexual. The points of difference which appear in the descriptions of authors who have subsequently described *Macropis labiata* are such that it is evident that more than one European species exists; yet, on account of the brevity of the Fabrician descriptions, there is nothing at variance with them, excepting locality and the colouring of the hair of the thorax, which Fabricius described as *ferruginous*. Examining other descriptions, we find that the hair of the thorax has been described as "ferruginous" in Austria, "fulvous" in Germany, "pale fulvous" in England, "griseous" in Germany and Scandinavia, "cinereous" in Finland. The German species, with fulvous thorax, Schenck called *fulvipes*, Fabr., that with griseous thorax he called *labiata*; but, *labiata*, Fabr., and *fulvipes*, Fabr., being the same, unless a re-examination of the types proves them distinct—and, in that case, Schenck has transposed the names—Schenck's *labiata* requires a new name. The descriptions of the French species by Latreille and Dufour I have not at hand, and, consequently, cannot determine the relationship of *Andrena lagopus*, Latr. Lest it should prove to be the same as *labiata*, Schenck (♀ = *labiata*, Panz.), and have priority, I omit to give a name for Schenck's species. The labrum, scape, and mandibles in the male of both the German species have been described as black. In Sweden, the labrum and a spot on the mandibles are yellow; in England, a spot on the scape and a spot on the mandibles are yellow. Whether these differences indicate distinct species can only be determined by the study of more essential characters in the European species. The colouring of the labrum is a specific character in separating the American species. The descriptions of the English and Swedish authors afford no characters in regard to the delicate puncturing of the abdomen, the colouring of the posterior legs in the female, and the armature of the posterior tibiæ in the male. Schenck has indicated differences in these respects as follows: *labiata*, Sch., ♀, posterior tibiæ with white hairs, metatarsus black; *labiata*, Fabr., ♀, posterior tibiæ with white hairs externally, with golden hairs within and beneath, metatarsus brown above, with golden hairs within and

beneath, abdomen more finely and sparsely punctured. According to Nylander, who examined the types of Fabricius, the metatarsus of *fulvipes* type is, excepting the apex, clothed with yellow hairs, thus differing from both of Schenck's species, but agreeing less with his *labiata* than with his *fulvipes*.

The form from Southern Finland mentioned by Nylander (Adnt., ex. mon. Ap. Bor., p. 249) also resembles the latter, having the "sco-pula fulvous."

Taking Schenck's characters for the German species, the following synopsis will enable the *males* of the known species of the genus to be distinguished.

LABIATA, Fabr. Tip of hind tibia drawn out beneath into a tooth, before which is another small blunt tooth.

LABIATA, Sch. A slight emargination on the inner border of the hind tibia before the tip, the tip not drawn out into a tooth.

CILIATA. Lower face of hind tibia produced at apex into a short three-toothed process.

PATELLATA. A stout, oblique, truncated projection from the tip of the hind tibia beneath.

Waterbury, Connecticut, U.S.A.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(Continued from vol. xvi, page 244).

Asthenia scopariana, H.-S. This very pretty species (new to Britain) has been reared by Mr. J. B. Hodgkinson from larvæ found by him at Dutton, near Ribchester, Lancashire, but, by an unfortunate oversight, the food plant is not certain. Most probably it was the common broom, but no doubt the discoverer will remedy the oversight by next season. The moth is closely allied to *cosmophorana* and *coniferana*, as well as to *splendidulana* and *strobilella*. It is placed by Wocke between *corollana* (*Heegerana*) and *cosmophorana*, and by Heinemann between the latter species and *Zebeana* in the vast genus *Grapholitha*. In Wilkinson and Stainton's arrangement, it should follow *cosmophorana* in the genus *Asthenia*; in Doubleday's it might be placed in either *Coccyx* or *Stigmonota*.

A short description of the moth may be useful—

Fore-wings dark olive-brown from the base to beyond the middle, thence pale golden-brown; markings pale silvery, consisting of three pairs of short costal streaks (sometimes with additional costal spots between them), the first pair nearly or quite uniting with a slender, upright or slightly curved dorsal streak, the second pair also nearly uniting, with an oblique *curved* streak, which reaches the anal angle, and the

third pair similarly nearly uniting, with a *perpendicular* streak, which also reaches the anal angle, passing outside the ocellus, which contains three or four black streaks. Hind margin edged with a deep black line, which is interrupted below the apex by a silvery blotch. Cilia pale silvery-grey. Hind-wings of the male pale grey, with the base whitish, the apical angle white, a deep black line along the hind margin, and a white blotch inside it; of the female darker grey, with the white apical angle and deep black marginal line. Cilia whitish. Head and antennæ dark grey, palpi paler.

This species has not hitherto been recorded in the United Kingdom, but is found in Germany, Galicia, Livonia, and Servia. It does not seem to have been previously reared, but nearly every author records it as occurring among *Spartium scoparium* or *Genista*, in woods or wood-meadows. Its time of appearance is April and May.

Eupæcilia atricapitana, Steph. I find that the early summer brood of this species is produced from larvæ which feed in the autumn and winter in stems of *Senecio jacobæa*, causing a slight distortion of the stem, and that they remain in the burrow until the spring, frequently spinning up and assuming the pupa state therein, but in some cases leaving the stem to spin up elsewhere. The moths emerge in May and June.

Some of the distorted dry stems were gathered for me this spring at Eastbourne, Sussex, by Mr. W. H. B. Fletcher, and I afterwards found a few in the quarries here. Moths have emerged from both.

Eupæcilia udana, Gn. In Ent. Mo. Mag., vol. xi, p. 191, I quoted a description of the larva of this species made by M. Ragonot, from specimens preserved in spirits. This description I can now compare with one made from a living larva kindly sent me by Dr. Wood, of Tarrington, Ledbury.

Moderately plump and rather thickest in the middle, dull yellowish-pink or pinkish-brown, greyer towards the head, dorsal line faintly greyish-brown, spots shining, hardly visible, hairs very minute, head and divided dorsal plate bright black-brown, anal plate pale brown.

Feeding within the dry flower-stem of *Alisma plantago*, full-grown about the middle of October, eating the pith and leaving frass scattered irregularly along the burrow. Pupa chestnut-brown, with dark brown wing-sheaths. In a slight cocoon of white silk, placed inside the dry stem of *Alisma*, not occupying the whole width of the burrow, but attached to one side, and having a hole cut nearly through the bark for exit. Through this the pupa pushes its way before the moth emerges.

On receiving a larva from Dr. Wood, I went to a little pond at a corner of a lane for some *Alisma*, and there found two or three larvæ. The species had not previously been observed in this neighbourhood. The moths emerged in June, July, and August.

Eupæcilia notulana, Z. Along with the last species Dr. Wood sent me some larvæ of this, from which I took the following description :—

Smooth, stout, nearly cylindrical, but with the segments slightly swollen in front, inactive, naked, pale yellowish-green, greener when young, dorsal vessel visibly brownish, spots indistinct, grey. Head and divided dorsal plate shining black, anal segment and plate very pale brown.

Feeding in October in stems of *Mentha hirsuta*, apparently entering at a joint and working upwards, feeding on the pith, and leaving the lower part of the burrow tightly packed with excrement. Hibernating within the stem, and generally spinning up therein, but occasionally deserting it to spin elsewhere. Pupa light brown, in a cocoon formed of white silk and frass, forcing itself out before the moth emerges in June.

Lord Walsingham found larvæ of this species feeding in the same manner in stems of *Lycopus europæus* at Wicken Fen. The moth in this case emerged in July.

Eupæcilia ciliella, Hüb. Through the kindness of my old friend Mr. Sang, I have been enabled to secure a description of the larva of this species, which I append, as it differs slightly from those already published :—

Plump, sluggish, shining, shortly tapering at the anal extremity, white, with hardly visible spots, naked, except a few hairs towards the hinder end, head and dorsal plate shining jet-black, anal plate very small, pale brown, on the back of the ninth segment is a distinct reddish-brown internal blotch. When full-grown it becomes tinged with pink.

Feeding in August on the seeds of the cowslip (*Primula veris*), leaving the seed vessels, when full-grown, and spinning up in hollow sticks or dead stems, where it hibernates, assuming the pupa state in the spring. Pupa light brown, with darker brown wing-sheaths, protruding from the cocoon before the moth emerges—in June.

Argyrolepis zephyrana, Tr. Larva one-third of an inch in length, broadest at the second and third segments, and tapering to the anal extremity, with segments deeply divided and ridged, yellow, spots barely visible, hairs minute, head rather broad, pale brownish, with a brown line in front of each eye enclosing the mouth, which is dark brown, plates shining pale yellow. In the autumn and winter, in the stems of *Daucus carota*, eating out the pith and filling the space with frass, still feeding in the dead stems, or working back through the frass, as late as April, and spinning a very slight brownish cocoon in the tightly packed mass of frass in the stem. Pupa very pale yellowish-brown, extruded from the stem, and often falling out when the moth emerges—in June.

For the opportunity of describing this and the following species, I am indebted to a kind friend who collected them for me in Cambridgeshire.

Lozopera Francillana, Fab.

Larva short, plump, cylindrical, dirty yellowish-white, head black, dorsal plate faintly brown, with two dark brown spots at the posterior edge, anal plate small, faintly brownish with a dark spot in the middle.

Feeding in the autumn and until April in the stems of *Daucus carota*, eating the pith and filling the space with frass, through which it seems to work back in the spring. It appears also to make small cocoon-like chambers in the frass, and then abandon them, but ultimately spins up in the stem and becomes a light brown pupa, which pushes itself through the bark of the stem when the moth emerges : this takes place in July and August.

My remark in vol. xi, p. 196, that the larva had been reared from seeds of *Daucus carota* seems to have been a mistake. At the same time I quoted from M. Jourdheuille's Calendar : "Larva in dead stems of *Eryngium campestre*," and remarked that this must refer to another species. A short while ago, M. Ragonot sent me four beautiful specimens of *flagellana*, Dup. (giving *eryngiana*, Heyd., as a synonym), telling me that they were reared from dead stems of *Eryngium campestre*. These specimens differ from *Francillana* in being less glossy and of a more ochreous yellow, and in having the first oblique fascia abbreviated and slightly clubbed at the apex, with a spot opposite it on the costa, while the second fascia is more curved, attenuated in the middle, and often has a short row of dots outside it. This species seems constant in its markings, and is intermediate between *Francillana* and *Smeathmanniana*.

Heinemann (p. 80) gives *flagellana*, H.-S., as synonymous with *Francillana*, Fab., and Wocke includes *flagellana*, Dup., as well as *flagellana*, H.-S., under *Francillana*, Fab., but he gives *eryngiana*, Heyd., as a distinct species. I have no opportunity now of ascertaining whether Duponchel's and Herrich-Schäffer's *flagellana* are the same species, but I think there can be no doubt that *flagellana*, Dup., should be separated from *Francillana*, F., as a distinct species, with *eryngiana*, Heyd., as a synonym.

Pembroke : 16th June, 1880.

Stigmonota scopariana, a Tortrix new to our list.—This very handsome species I bred the last week in April and first week in May. I had no idea of my prize, in fact, at first I thought they were only very big *Lithocolletis ulmifoliella* until I chloroformed one and then saw it was a *Tortrix* which at the time I set down as *Coccyx splendidulana*, until I took them to Preston to compare, and at once saw I had a puzzler. I sent one to Mr. Stainton, who did not know it, then I sent it on to Mr. C. G. Barrett, he wrote me what he thought it was, but wanted to see both sexes ; I then sent him both sexes, and he at once wrote me they were *Stigmonota scopariana*. I imagined the larvæ had been obtained from mountain ash, but the name *scopariana* at once made me think whether I had ever been among broom, as it is scarce at Dutton ; there are some broom bushes about 50 yards from my house which I beat only once and put any larva in along with those I beat among mountain ash, &c., so most likely the pabulum of this gem is the broom. I bred six specimens in all.—J. B. HODGKINSON, 15, Spring Bank, Preston : June 13th, 1880.

OCCURRENCE OF THE NEUROPTEROUS GENUS *DILAR* IN SOUTH AMERICA.

BY R. McLACHLAN, F.R.S., &c.

I have for some time had in my collection an insect belonging to the singular genus of *Neuroptera-Planipennia* first made known by Rambur under the term *Dilar*, taken by the Rev. T. A. Preston in the neighbourhood of Rio Janeiro in November, 1872. As this genus is altogether new for the South American Fauna, its occurrence in that Continent is an interesting fact in Geographical Distribution, and it is well that its representative there should be characterized.

DILAR PRESTONI, n. sp.

Body blackish-fuscon, varied with testaceous or yellowish. On the disc of the head, above, are two very large median, sub-contiguous, rounded elevated tubercles, placed somewhat obliquely, and in front of these a single still larger, somewhat conical tubercle;* on the sides of the disc, toward the eyes, the head is depressed and excavated. Antennæ dirty whitish, the short stout basal joint and the second somewhat testaceous: the succeeding joints (up to the 9th, the rest broken off) are slightly longer than broad, each with a dusky ring at its apex; the third has a short branch, all the others a long, stout, straight branch, somewhat dusky, and rather pubescent, gradually increasing in length, so that the branch of the 9th joint is seven or eight times the length of the joint itself, and that of those preceding only slightly shorter. Palpi and legs pale yellowish-white, the latter strongly pubescent. Abdomen very obtuse (the anal parts not capable of definition). Wings pale whitish-hyaline, slightly iridescent, densely and transversely reticulated or chequered with pale grey markings; neuration fuscous, with long blackish hairs: in the anterior-wings the first four or five costal nervules are simple, afterwards a forked nervule and a simple one alternate, and there is a marginal rudiment between each and in each of the forks; principal sector 6-branched, the branches furcate or bifurcate, and each branch also ends in a minute marginal fork with the usual intermediate marginal rudiments; two nervules between the sector and the radius, the other transverse nervules very few in number; a dusky horny point between the first and second branches of the sector: in the posterior-wings the neuration is similar in arrangement; the sector is 6-branched, but the branches have mostly only the minute marginal fork.

♂. Length of body, about $2\frac{1}{2}$ mm. Expanse, $10\frac{1}{2}$ mm.

Remarkable for its very small size as compared with the species of the Old World; but it appears to be absolutely congeneric, differing only in the lesser number of transverse nervules in the wings. It deceptively resembles the species of a group of European *Psychidæ*.

Lewisham, London: *May*, 1880.

* These protuberances were mistaken by Rambur for ocelli, an error duly pointed out by Hagen in the *Stett. ent. Zeitung*, 1866, p. 292.

DESCRIPTION OF A NEW SPECIES OF *TORYMUS* FROM SCOTLAND,
WITH NOTES ON OTHER BRITISH SPECIES OF THE GENUS, &c.

BY P. CAMERON.

TORYMUS CAMPANULÆ, *sp. n.*

Green or bluish-green, pilose; antennæ black, the scape on the under-side yellow; the 2nd joint of the flagellum slightly longer than broad. Legs yellowish, the greater part of the coxæ and of the posterior femora green; the four anterior femora with a greenish line on the outer side, and slightly brownish on the other side; posterior tibiæ fuscous, except at base and apex; the apex of tarsi fuscous; the calcaria short, scarcely a third of the metatarsus in length. Abdomen compressed, longer than thorax; ovipositor as long as abdomen and two-thirds of the thorax.

The ♂ has the scape green on the under-side, and agrees otherwise in coloration with the ♀, except one specimen, which has the head, thorax, posterior coxæ, and abdomen suffused with bronzy splashes. The wings are hyaline; the costa with a hair-fringe.

Length, 2—3 mm.

Of the species in my collection it comes closest in coloration and length of ovipositor to *T. hibernans*, Mayr, but it is a narrower insect, the abdomen is longer compared with the thorax, and more compressed, the antennæ longer, and the spurs much shorter.

Bred in July and August from the galls of *Cecidomyia campanulæ*, Müller; found in various parts of Clydesdale. Dr. Gustav Mayr has kindly examined specimens, and has confirmed my opinion as to its being an undescribed species.

Torymus viridis, Förster, Beitr. z. Mon. d. Pter., 1841, p. 32; Mayr, Verh. z.-b. Ges. Wien, xxiv, p. 123, 4; I find this near Glasgow in galls of *Rhodites eglanteriæ*.

Torymus tipularum, Zett., Ins. Lapp., 1840, p. 420; Mayr, *l. c.*, 111, 27; Thoms., Hymen. Scand., iv, 95, 26; = *Torymus pumilus*, Ratz., Ichn. d. Förstins., i, 1844, p. 180; this I have bred here from the rose galls of *Cecidomyia rosaria* on willows.

Torymus sodalis, Mayr, *l. c.*, 120, 36, I found last October ovipositing at Milngavie in the galls of *Neuroterus lenticularis*. The ovipositor was inserted at the side, under the flat projecting part of the gall, which was then a little swollen. It would seem to be a good species, and readily distinguished from the other spangle-gall *Torymus (hibernans)* by its shorter ovipositor.

Torymus juniperi, Linné, Fauna Suec., 408, 1635, *sec.* Mayr, *l. c.*, 109, 23, I reared this spring in abundance from the galls of *Hormomyia juniperina* collected last year on Clober Moor. It is apparently identical with *T. amethystinus*, Boh., Vet. Ac. Handl., 1833, p. 370; and Thoms., Hymen. Scand., iv, 85, 10.

Torymus caudatus, Boh., Vet. Ac. Handl., 1833, p. 365, *sec.* Thoms., Hymen. Scand., iv, 84, 6, has been sent me by Mr. J. E. Fletcher, who reared it from fir cones collected in the hopes of rearing *Coccys strobilana*. Mayr (*l. c.*, p. 100) considers *caudatus* to be a variety of *azureus*, Boh., in which opinion I am inclined to agree with him, for the two forms (*azureus* and *caudatus*) appear to merge together when we examine a large number of specimens, while they both frequent fir-cones. *T. azureus* is the form which I recorded Trans. Ent. Soc., 1879, p. 119. It has the ovipositor shorter than in *caudatus*, and generally the colour is violet and not obscure green, as in the last mentioned. Thomson regards them as two distinct species.

I find that these insects are much better examined by setting them on silver wire than by carding them, as is usually done in this country. Not only are much better results obtained by this method, but much time is saved the student, the sticking of a wire through an insect taking up far less time than spreading out its legs, wings, &c., by means of needles and gum on cardboard; while, not unfrequently by the latter method, unless great care be taken to display the various parts, the form of the joints of the antennæ and legs cannot satisfactorily be made out; it may be owing to the employment of too much gum, or to the parts not being displayed sufficiently. The method is very simple. All that is required is to get silver wire* of the thickness required, cut it up in lengths (say 4 lines each), taking care to cut off the points as obliquely as possible; stick one of these through the thorax of your insect; then insert the wire with the insect on it in a piece of pith (that of the Jerusalem artichoke will do), which may hold only one insect or several, according to taste; finally, place an ordinary pin through the piece of pith, and, by means of it, stick the whole in the cabinet. If all this be done properly, no part of the insect need be disturbed, which would certainly be the case if ordinary pins be employed for the smaller species.

I do not, however, mean to say, that carding has no advantages. The above remarks refer only to *Chalcididæ*. I have not succeeded so well with *Oxyura* and parasitic *Cynipidæ*, owing to their much harder and smoother bodies; these insects are not easily pinned, the wire generally slipping off, while the successive attempts to insert it usually lead to the destruction of the insect. Such, at any rate, has been my experience; but no doubt, with greater experience, the difficulty might be got over. My views on the comparative advantages of carding and pinning *Hymenoptera* I have stated elsewhere (Proc. Nat. Hist. Soc. Glasg., 1877, p. 144), so I need not refer to the subject here.

Glasgow: May, 1880.

* Silver wire of any thickness may be had from Corney & Co., 70, Little Britain, London, E.C.

Carabus clathratus, &c., in Ireland.—It is well known that this grand *Carabus* is no rarity in some parts of Ireland, though it is certainly not a species of common occurrence in England (judging from the few specimens I have seen in collections). At Teelin Bay, Co. Donegal, I took more than 40 examples, in less than an hour's work, on the evening of April 28th. They occurred under loose stones on the tops of turf walls, in a rather boggy place of very limited extent. With them and in the immediate neighbourhood of their locality I found *Carabus granulatus* (abundant), *violaceus* (a few), *Calathus melanocephalus* var. *nubigena* (less than 100 feet above the sea level), *Staphylinus erythropterus* (in numbers), *Silpha subrotundata* (13), *Cryptohypnus riparius* (common), &c.

C. clathratus has also occurred to me at Dinish Island (Co. Galway) and near Westport, but very sparingly in both these localities.—JAMES J. WALKER, H.M.S. "Hawk," Galway: May 20th, 1880.

Lithocharis castanea, Gr., near Wimbledon.—A single specimen of this rare beetle was captured by me at the roots of heather near Cæsar's Camp, Wimbledon, at the end of last March. I have since then visited the same place several times in hopes of finding another, but hitherto without success.—W. J. SAUNDERS, Wray House, Wimbledon: June, 1880.

[The late Mr. Keeley took this species in the road leading from Wimbledon Common to Wandsworth.—E. C. R.]

Occurrence of Tachinus rufipennis, Grav., near Barnstaple.—I found a specimen of the above beetle at Filleigh, near Barnstaple, by shaking roadside rubbish over paper in February last; the weather was very cold and wet, or I might possibly have found more. Its shining red elytra with black tips distinguish it easily from any of the other species of the genus. I believe it has only been taken twice or three times in England before.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: June, 1880.

Is the number of moults of Lepidopterous larvæ constant in the same species?—I have been impressed lately with the uncertainty that seems to exist as to the number of times Lepidopterous larvæ moult in the course of their growth, and have been considering whence this uncertainty springs. Does it arise from the difficulty of watching each individual, when one is rearing a brood from the egg? For though all the larvæ may be hatched on the same day, some are sure to outstrip the rest in growth, and so one is apt to get confused in the reckoning. Or is it quite certain, as many certainly think, that the number of moults varies in the same species?

Boisduval in his Introduction to Tome 1 of *Lépidoptères* (Suites à Buffon) says "Le nombre des mues varie peu dans une même espèce, et peut-être même dans l'état sauvage est-il toujours constant. Mais chez quelques chenilles velues, que l'on élève en captivité, il peut-être augmenté ou diminué par une nourriture plus ou moins abondante:" this passage is the plainest assertion I can find of this variation in the number of moults, and the writer gives a reason for it, but I have also noticed that other writers state that they *thought* (they do not speak positively) there was no constancy in the number of moults undergone by the individuals of the same brood—reared altogether under the same conditions; but I do not myself like to agree to this view until I can have some good proof of it.

I know that the number of moults certainly varies in different species; I have

myself made sure that six is the number for some, and nine for others as in the instance of *Nola centonalis*; but I never recorded so few as *one*, the allowance which has been meted out to *Sphinx ligustri*,* nor so many as *ten* or *twelve*, the number with which *Chelonia caja* and *Lithosia caniola* have been respectively credited.

Any one, who has made notes on which he can depend about the growth of any species he has reared, would I think do good service by publishing them, even if he has nothing else to say about the larvæ; and those, who are just about to take fresh broods in hand, would help to settle the question for each species, if they would isolate examples of each brood, and accurately record the changes noticed. I know this would be troublesome, but I do not see how otherwise we can get upon sure ground in this matter: I should be glad to see records of the commonest things—*M. brassicæ*, *S. lubricepeda*, or *M. fluctuata*—so that they were accurate.

Daily inspection will be needful, and the approach of a moult and its accomplishment may at once be known by the appearance of the head of the larva; before the moult it seems too small and stretched forward from the neck—after the moult it comes out in extra width as compared to the second segment, with its colours distinct.—WILLIAM BUCKLER, Emsworth: *June 10th*, 1880.

Vanessa cardui double brooded.—Most entomologists have commented upon the extraordinary appearance of *V. cardui* in 1879, advancing various theories as to whether many of them did not migrate from the continent to this country. Concerning this I do not wish to give an opinion; I only know that the swarms that began to appear in this neighbourhood about the middle of August were certainly bred in the country, coming out as they did, without a sign of travel upon them, during the few hot days which occurred at that season. And these, moreover, corresponded with the unusual numbers of larvæ which were to be found upon the thistles at the end of July. They were in far greater numbers than I ever remember having noticed before. The larvæ then found were feeding on the full-grown thistles, nearly always high up the stem, and near the flowers. Soon after these had completed their changes, and had emerged as beautiful insects in the imago state, there came some high winds off the sea, and withered the thistles, which, by that time, had run to seed, and thus the chance of finding more larvæ appeared to have passed away. About the 1st of October, however, and for the next fortnight, I began to find them again, but not in their former situation. These new larvæ were on the young seedling thistles which remain, without shooting up, flat upon the ground till next season. On the back of the leaves, lying close to the surface of the ground, I found several young larvæ, some half-a-dozen of which I kept and fed up, and others I gave away. I had some curiosity to ascertain when these unseasonable little creatures would arrive at maturity, as the weather was then cold, and might at any time have changed to frost. Between the 18th and the 20th of October, most of them changed into the pupa state, and, on November 20th, one of them emerged as a perfect *V. cardui*, in every respect as fine as those hatched in August. The rest failed to come to maturity. These facts, I think, seem to prove that in some cases this insect was double-brooded last year: whether they are usually so I will not venture to say; but these late ones, from the time they appeared in the larva state,

* N.B.—Albin records of a brood of *Sphinx ligustri*, which he reared from the egg, that they moulted *four* times in their course.

and from the situation in which they were feeding, after the original food-plants had been destroyed, must, I think, have been produced from eggs laid by some of those which were swarming around us in August; and, late as they were, they refused to pass the winter in the pupa state.—CLENNELL WILKINSON, Castlemartin: 16th June, 1880.

[Is not this an indication of an instinctive attempt at following up the habit of the species in a hotter climate, where two broods in the year are possible and usual? —C. G. B.]

Description of the larva of Ephestia ficulella.—Along with the larvæ of *Plodia interpunctella* received from Mr. J. R. Wellman, on the 21st December, 1878, and already described in this journal, were several of an *Ephestia*, from which, on the 27th of August following, a single specimen was bred, agreeing perfectly with an example in my cabinet named *ficulella*.

Length about half an inch, and of average bulk; head highly polished, it has the lobes rounded, and the mandibles prominent; body cylindrical, tapering anteriorly, the head being the narrowest segment; there is a distinct polished plate on the second segment behind the head, and a small similarly polished space on the anal segment; skin very glossy and rather wrinkled.

The ground colour a pale pinky-flesh, varying in depth of colour in different specimens; head and mandibles dark sienna-brown; frontal plate still darker brown, almost black: dorsal, sub-dorsal, and spiracular lines all very distinct, and about equal in width, pink; and there is still another, but a narrower, of these pink lines, below the spiracles; spiracles minute, dark brown; tubercles large, raised, and polished, very dark brown, in some specimens nearly black.

Ventral surface greyish-white, with a faint pink tinge; legs and prolegs tipped with brown. Feeds on dried figs.—GEO. T. PORRITT, Highroyd House, Huddersfield: June 5th, 1880.

Nemophora pilella in Lancashire.—Last season I took a longhorn among *Vaccinium*, high up on the moors at Green Thorn about a mile above Stonehurst College; I suspected it was *N. pilella*, but only having one specimen to look at I had to let it stand over; but to show how eyes vary in seeing differences, or rather in not seeing the most striking and positive characters in determining those differences, I may note a keen careful eye like C. S. Gregson's could only make the specimen in question a ♂ of *Metaxella*, whereas H. T. Stainton made it into *Schwarziella*, but I still thought it ought to be something different on account of the situation being so totally at variance with where *Schwarziella* occurs. Well, this season I was determined to settle the question, and towards the end of May I set off again in quest of more specimens and to see the habits and general ways of the supposed *pilella* or a new species. I took a score of specimens of both sexes in splendid condition, flying in the hot sun, most actively starting up from among the *Vaccinium*, and when soaring up into the fir trees they looked almost like worn *Adela viridella*, giving them quite a green shining tint; the flight first of all in general appearance settled me they were no *Schwarziella* and no *Metaxella*, I take the latter among alders about 2 miles lower down. In the next place, just get *pilella* into your net and it wants all the wind you can spare to blow it back in the net to box it, and when boxed it runs about as

rapidly as *Tinea pellationella* in the box. I watch them carefully through the glass-topped boxes, those habits conclusively put *Schwarziella* to one side. I sent six to Mr. Stainton, both sexes, in fine order, he writes me they are *Nemophora pilella*, a species that has been taken in Glen Tilt, and at Rannoch, Scotland, and among *Vaccinium*, in Germany; now that he sees a fine series, not having before seen many specimens, he has no doubt mine are this species, the main and most distinctive difference being the dark under-wings which are quite of a purplish black, I may add there are no other plants for the larva to feed on but *Vaccinium* and fir, little or no heath grows beneath the fir trees; I never had this species before, and what I have seen under this name in collections are only *Schwarziella*; even *Schwarziella's* fore-wings are not as rounded as those of *N. pilella* nor yet so scaly; it comes near *Metaxella* in general appearance.—J. B. HODGKINSON, 15, Spring Bank, Preston: June 13th, 1880.

Strange habitat for the larva of Batrachedra præangusta.—On the 10th inst., I received from Lord Walsingham a healthy living larva of this species, which he had found in a nest of a goldfinch. Lord Walsingham writes thus:—"In the lining of "a goldfinch's nest I found to-day the larva sent herewith. At first it puzzled me "much, but when I saw the lining of the nest was made of the cotton-like down from "the sallow catkins, I recognised the larva of *Batrachedra præangusta*. During the "last two seasons I had searched more than once for this larva to send you, but in "vain".

The occurrence of larvæ in birds's-nests is nothing unusual, as they are the natural habitat of *Tinea lapella* and possibly of some other species of the genus *Tinea*; but in the present instance the larva was a *foreign body accidentally introduced*, and no doubt the larva itself helped to explain to Lord Walsingham of what materials the lining of the nest was really composed, for the larva of *B. præangusta* is so remarkably conspicuous that any one who has once seen it can hardly fail to recognise it wherever met with.—H. T. STAINTON, Mountsfield, Lewisham, S.E.: June 12th, 1880.

Eidophasia Messingiella at Hökendorf, near Stettin.—On the 16th instant (I was then on a visit to Dr. Dohrn, at his residence at Hökendorf), I went in the forenoon to a locality where I knew that the larva of *E. Messingiella* was to be found on *Cardamine amara*. Though we had had a long period of dry weather, I found it just as moist in the alder-woods as usual. I remained there sweeping the low herbage (though much tormented by midges) for two hours and collected upwards of 100 larvæ, of different sizes, of *Eidophasia Messingiella*. To-day about a score have spun up and two are already in pupa.—P. C. ZELLER, Grünhof, near Stettin: May 21st, 1880.

Mamestra pomerana, at Misdroy on the Baltic.—My friend Professor Hering has made two excursions lately. He and Herr Büttner were at Misdroy on the Baltic, where they obtained from under the roots of *Artemisia maritima*, buried in the sand, about 150 pupæ of *Mamestra pomerana*. (I do not know whether this species has yet been detected in England). At the same place they also found a number of larvæ of *Agrotis præcox*.—ID.

[*Mamestra pomerana* is described by G. Schulz in the Stettin. ent. Zeitung, 1869,

p. 51; Staudinger refers the insect as a variety to *Mamestra Leineri* of Freyer (N. B. 184, 3). It may be worth searching for on our Eastern coasts, where *Artemisia maritima* grows freely.—H. T. S.]

Coccyx Ochsenheimeriana near *Thetford*.—I have met with six more specimens of *Coccyx Ochsenheimeriana* here lately among *Abies cephalonica*. Their habit appears to be to fly about 4 o'clock in the afternoon in the sunshine, at the ends of branches of the above-named fir.

I rather hope to breed them another year from the cones, if, as I fancy, their habits are similar to those of *C. strobilana*. It is a beautiful little species, but very scarce. I have worked many days for them lately and have had men looking for them for the last three weeks, with only the small result which I have mentioned.—WALSINGHAM, Merton Hall, Thetford: *June 14th*, 1880.

Argyresthia ærariella (Stainton, *Ent. Ann.*, 1871, p. 100, and 1874, p. 25) bred.—From larvæ collected last August at the Brushes, near Manchester, feeding in the berries of mountain ash, I have just bred a series of *Argyresthia ærariella*. Plenty of *A. conjugella* are emerging, but no intermediate forms have yet appeared; *ærariella* is certainly a species, the males and females copulate freely, but never yet have been observed to do so with *conjugella*. I am sorry to say that this insect is not likely to be abundant.—J. H. THRELFALL, 4, East Cliff, Preston: *June 2nd*, 1880.

Discovery of the winged form of Prosopistoma punctifrons.—On the 7th inst. I received a hurriedly-written post-card, dated the 5th, from Dr. Emile Joly, of Marseilles, announcing the fact that his colleague, M. Vayssière, had just shown him a bred sub-imago of *Prosopistoma punctifrons*, which proved to be one of the *Ephemeridæ*, of small size, with four wings and three caudal setæ. Thus, the persistent energy of Prof. N. Joly and his son, and of M. Vayssière, has solved a mystery that has existed since 1762, when Geoffroy first described the aquatic condition as "Le Binocle à queue en plumet," which subsequently found itself located by Latreille in the *Crustacea*, under the name *Prosopistoma punctifrons*. The entomological public awaits with natural impatience fuller details of this most interesting discovery.—R. McLACHLAN, Lewisham, London: *18th June*, 1880.

The generic name Pachymerus in Hemiptera.—In vol. xvi, p. 260, I said that "*Pachymerus* is not available in *Hemiptera*, unless it can be shown that Latreille and Amyot and Serville were in error."

Dr. Puton replies (*Bull. Ent. Soc. France*, No. 8, 1880, p. 83) by repeating his former statement that *Pachymerus*, Lep. et Serv. (*Hemiptera*), has priority over *Pachymerus*, Latr. (both dated 1825), because it is cited by the latter author, and this, notwithstanding, he has just before, in the same work, used the name for a genus of his own; and Dr. Puton further says that Amyot and Serville were mistaken as to dates, and accepted as prior a name which at the time (1825) was unpublished. Now, I put the matter hypothetically, because I gave Latreille credit for knowing what he was about, and was only employing a name he had previously brought into use; and I naturally believed that Amyot and Serville also were sure of their statement concerning the priority of Latreille's genus and their consequent

deposition of that of Lep. and Serv. Dr. Puton, however, says that when I can quote a work of Latreille, prior to 1825, in which he established the genus *Pachymerus* in *Coleoptera* he will be of my opinion. It rests on Dr. Puton's inference that such a priority does not exist, that the name *Pachymerus*, Lep. and Serv., must be revived in *Hemiptera* and *Pachymerus*, Latr., be suppressed in *Coleoptera*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: May 22nd, 1880.

Review.

THE GEOLOGICAL ANTIQUITY OF INSECTS, twelve papers on Fossil Entomology: by HERBERT GOSS, F.L.S. London: John Van Voorst, 1880, 50 pp. 8vo.

Mr. Goss, with a view (as we believe) to rendering them known amongst Geologists as well as amongst Entomologists, has reprinted and published (in a cheap separate form) the series of papers by him that appeared in Vols. xv and xvi of this Magazine, with such additions and corrections as appeared necessary. The combined papers constitute a very useful outline sketch of what is known, and of what has been done, in a special branch of palæontology, and cannot fail to be useful, especially for the copious bibliographical references.

Obituary.

Professor Kirschbaum.—On the 2nd March last, Dr. Carl Ludwig Kirschbaum, Professor at the Gymnasium in Wiesbaden since 1848, died at the age of 68 years. In the "Entomologische Nachrichten" of the 15th April is a long biographical notice extracted from the "Niederrheinischen Zeitung," by which it appears that he was for 25 years Inspector of the Natural History Museum at Wiesbaden, and that he was highly esteemed in his own country and honoured in others. To Entomologists in general he is known by his "Die Rhynchoten der Gegend von Wiesbaden, Die Capsinen," 1855; "Die Athysanus-Arten der Gegend von Wiesbaden," 1858; and "Die Cicadinen der Gegend von Wiesbaden und Frankfurt a.M.," 1868. These works have their merits and demerits; the errors of identification, re-description of known species as new, &c., being due in a great degree to want of research and communication with contemporary workers.

ENTOMOLOGICAL SOCIETY OF LONDON, April 7th, 1880.—H. T. STANTON, Esq., F.R.S., &c., Vice-President, in the Chair.

The following were elected ordinary Members, viz.:—Messrs. C. G. Bignell, of Stonehouse, Plymouth; W. D. Cansdale, of Witham, Essex; Frank Crisp, LL.B., Secretary Royal Microscopical Society, and the Rev. W. W. Fowler, M.A., F.L.S., of Repton, Burton-on-Trent. Mons. E. André, of Beaune, was elected a Foreign Member.

Mr. Carrington exhibited a pale variety of *Arctia caja*, bred by an experimenter as to the effects of coloured glass with reference to variation; there was no reason to believe in any correlation between the variety exhibited and the conditions under which it was bred.

Mr. Rothney communicated "Notes on the attraction the *Dahlia* causes to insects in North India," as opposed to remarks by Mr. J. W. Slater, at the meeting

on April 2nd, 1879. Mr. Rothney found the *Dahlia* very attractive to almost all kinds of insects which never suffered from any narcotic or otherwise injurious effects.

Mr. Cameron communicated "Notes on the coloration and development of insects."

Professor Westwood communicated "Notes on gynandromorphous examples of *Cirrochroa Aoris*, an Indian butterfly, and on *Cetonia aurata* and *Protactia Bensoni*."

5th May, 1880.—H. T. STAINTON, Esq., F.R.S., &c., in the Chair.

Mr. Peter Inchbald, of Hovingham, Yorkshire, formerly a Member, was re-elected.

Mr. W. C. Boyd exhibited a pale variety of *Nyssia hispidaria*, ♂, recently taken at light at Cheshunt Station.

Mr. Walhouse exhibited sundry Geodephagous *Coleoptera*, found at a great altitude in India.

Mr. Distant exhibited a long series of *Ptyelus Goudoti* from Madagascar (allied to our common Cuckoo-spit insect), illustrating the great variation that exists (as in *Pt. spumaria*). The larva was known to emit a frothy secretion, and in such quantities, that it dropped from the trees like rain.

Mr. Billups exhibited two living examples of *Carabus auratus*, found in the Borough Market, London, and believed to have been imported from Belgium.

Mr. Pascoe said he had lately heard it asserted that a *Sphinx* with a haustellum sufficiently long to reach the nectary of *Anagræcum sesquipedale* of Madagascar, had been recently discovered, and asked for confirmation of this. No Member present was able to confirm the statement.

Miss E. A. Ormerod, in presenting a copy of the "Cobham Journals," drawn up from observations on the correlation of meteorological influences with the condition of animal and vegetable life, made by Miss Molesworth at Cobham, Surrey, over a period of about 44 years (1825—1850), remarked on the necessity of combined action in making public similar observations in future.

2nd June, 1880.—SIR JOHN LUBBOCK, BART., M.P., &c., President, in the Chair.

Miss G. Ormerod, of Isleworth, and Mr. H. Lufton, of Chapel Allerton, Leeds, were elected Members.

Mr. Walhouse exhibited a collection of moths formed by himself at Mangalore, on the Malabar coast.

Mr. Finzi exhibited (on behalf of Mr. Lowrey) an example of *Arctia fuliginosa*, in which one antenna was congenitally absent. The President stated that he had occasionally bred ants with only one antenna, and one example with no antennæ, this latter being helpless when out of the nest.

The President exhibited an Australian ant, allied to *Camponotus*, remarkable for having its abdomen enormously distended (resembling that of a gravid queen Termite), so that it was little else than an animated honey-bag. In this it was analogous to another (American) species forming the genus *Myrmecocystus* of Wesmael.

The Rev. H. S. Gorham communicated the concluding part of his "Materials for a Revision of the *Lampyridæ*."

SOME FACTS IN THE LIFE-HISTORY OF *GASTROPHYSA RAPHANI*.

BY J. A. OSBORNE, M.D.

Having hibernated in the perfect state, underground, as I believe, the beetles of *Gastrophysa raphani* reappear in spring with the first warm weather at the end of March or beginning of April. At their earliest resurrection, still sexually immature, male and female are undistinguishable, except as larger size and earlier appearance afford a presumption in favour of the latter sex. Very soon, however, begins that enlargement of the abdomen in the ♀, due to the development of the ovaries, and the formation of eggs in them, from which the genus takes its name, and which, to save circumlocution in speaking of it again, may be conveniently designated by the term *gastrophysm*. Until gastrophysm has been, to some extent at least, developed, I believe there is no fertile union of the sexes. No eggs are laid until it has reached its full extent, when all the abdominal spiracles (four on each side) are completely uncovered, the elytra are tilted upwards reaching only to the middle of the high convexity of the abdomen, and even somewhat separated at the extremities. In the recently excluded imago, on the other hand, the dorsal and ventral segments of the abdomen are connected by a broad wing-like fold of skin along either side, in the angle of which the spiracles are seen looking directly upwards.

These insects eat, both in the larva and imago states, the various common species of dock and sorrel. The eggs are laid on the under-side of the leaf, only rarely, and, as it were, accidentally, on the upper. The batch consists usually of 40—50 eggs; and I have counted as many as nineteen batches on the under-side of a single leaf, and seen others with, I am sure, many more. The same ♀ will lay again perhaps in less than 48 hours, and will continue laying for some weeks.

The ovipositor is telescopic-tubular. It consists of (at least) two pieces. The outer tube, which is exerted first between the semi-circular valves of the pygidium, and remains exerted during oviposition, is bilabiate, having an upper and lower emarginate lip, which open by lateral angles. They are strengthened, especially the upper lip, by lateral, crescentic, chitinous thickenings, of darker colour, whose sharply defined convexity is towards the extremity of the lip, shading off less definitely forwards into the substance of the yellowish transparent tube. The upper lip, like the upper valve of the pygidium, has also a whitish ciliation. Shining through this upper lip, with its crescentic clouds, may be seen two black incrassate-linear appendages,

which are also furnished with whitish ciliæ at the broadened extremity, running backwards and inwards, but not meeting in an angle. This is the condition of things during the interval between the laying of two eggs. When an egg is being laid, or rather, during the latter half of the process, an inner transparent tube prolapses, bringing with it (attached to its upper lateral margins) the two black appendages just mentioned. The egg comes forward by jerks, and, after it touches the glass (I am describing the process here as watched *through* the glass cover of the pot on which the beetle was laying her eggs), there is a pause of some seconds before the complete extrusion of the egg. During this pause about half the egg is seen, and the ovipositor, viewed from the dorsal side, is hidden by the upper valve of the pygidium. Only at the final complete expulsion of the egg does the inner tube, with its appendages, come down. These appendages have motions of apposition with one another, and with the two chitinous portions of the lower lip of the outer tube, by which the end of the egg can be grasped as it were between four fingers; and it is so grasped and settled in its place, upon its side, in row with the other eggs, before anything more is done. The beetle then shifts its position a little; the ovipositor (the inner tube and its appendages having been retracted) is moved uneasily from side to side; and, after an interval of variable duration, another egg is seen coming forward by jerks to the glass (or other surface on which the eggs are being deposited). The whole process usually occupies something less than a minute. I reckon normally seven eggs in five minutes, but the rate varies much in different individuals, and is much slower towards the end of the batch. At this rate an average batch of eggs would be deposited in something over half an hour. As I have said, the eggs are laid almost universally on that surface of the leaf which is undermost at the time; and if, in confinement, a leaf be turned over while the beetle is engaged in oviposition, she will most likely walk away, and subsequently complete the operation on the other side of the leaf, it may be shortly, or it may be after an interval of several hours. One knows that it is the completion of the same batch by the sum of the two parcels agreeing with what was to be expected. The average number of eggs in a batch I found to be about 45, but the actual number varies in different females, though it is pretty constantly the same for the same individual; or rather, the *alternate* batches agree in number, a circumstance which seems to be accounted for by the alternate unburthening of themselves by two independent ovaries. Sometimes, however, both act together or in immediate succession, and a *double*

batch is the result, the number of the eggs in which is equal to the sum of two *successive* ordinary batches of the same individual; and when, as already mentioned, a beetle is interrupted in the middle of a batch, the next deposited eggs will be found to be the complement of the batch so interrupted; and if there has been any considerable interval between these two portions, there will be a corresponding interval between their times of hatching out, showing that the eggs are only fertilized when they are about to be laid, or in their passage from the ovaries to the ovipositor. The interval between two layings varies in different individuals, and sometimes in the same individual; but the average may be stated at two days or somewhat less. Twenty, thirty, or more than forty batches may be laid during the life of an individual.

As to the arrangement of the eggs upon the leaf, the first thing to be noticed is that they are laid upon their sides, and not set on end like the eggs of butterflies and those of the Colorado beetle, &c. The typical arrangement seems to be in rows, to the axis of which the long axis of the egg is inclined, at an angle somewhat under 90° . These rows are commonly broken in the middle by an angle which may have been originally determined by the furcation of the nerves of the leaf. The ends of the eggs in each succeeding row fit into the intervals between the ends of the preceding one; the last laid eggs, however, are commonly less regular in their arrangement. The whole batch has thus a somewhat fanlike or radiate appearance, and the apical or caudal angle, when it can be made out, indicates the first-laid end of the batch, and the direction in which all the tails of the future larvæ will be found lying; the first-laid end of the egg always (or nearly always*) being the caudal end.

The individual egg is of a generally elliptical contour, about $1\frac{1}{4}$ — $1\frac{1}{2}$ millimètres in length by half a mm. broad; but there is commonly a divergence from the perfectly elliptical form in two respects, impressed upon the egg, as it would seem, in the act of oviposition. During that pause of which mention has been made, after the first half of the egg has been extruded, its long axis no longer corresponds with the axis of the ovipositor, and a sort of curvature is impressed upon it, giving the egg a subreniform or sausage shape, except that its

* I have recently met with two apparent exceptions to this rule, both in the same batch, and in a portion of it where the eggs were very regularly disposed. Two eggs, viz., one in the middle of a row and one at the end of it, lay with their heads in the same direction as the tails of all the rest. Now, if these eggs, lying orderly in line with the rest, were not laid head-first in place of tail-first, the beetle, in laying them, and those immediately after them, must have executed a very nice, difficult, and apparently useless manœuvre in reversing her position some three or four times, so as to bring the eggs into the exact situations they would have occupied if she had gone on in the usual way.—J. A. O.

transverse diameter is not diminished (rather increased, perhaps) in the middle. Moreover, the grasping of the last half of the egg by the finger-like appendages (and I have seen the flexible shell strongly indented by their action) tends to force the contents towards the other extremity, and so diminish the size of the last laid, which is also the cephalic, end of the egg. These conditions are often persistent; so that I believe it may be possible to tell by them which side of the egg looked ventrally, *i. e.*, towards the surface of attachment, when laid, and which end will contain the head of the future larva.

When fresh laid, and enveloped in the glutinous matter, the eggs are perfectly smooth, shining and opaque. The colour is a clear yolk-yellow, varying a good deal in depth of tint in different individuals. I had once two females laying in the same pot whose eggs I could very easily distinguish in this way. There are often red ticks or short hyphen-like lines scattered sparsely and without regularity over the surface, like the markings on birds' eggs. I have seen a speck of this red matter on the glutinous substance extending between two eggs and not attached to either.

The eggs should be kept in a moist atmosphere during incubation, which preserves them plump and free from indentations, and greatly facilitates the hatching-out of the larvæ. I generally cut out the piece of dock with the eggs upon it, and put it into a plaster-of-paris tray covered by a pane of glass. The eggs may either be turned down in the natural position, or up towards the light; in any case, the venter of the larva develops on the side that is *uppermost*, whether that be the free surface of the egg or the surface of attachment.* This result is the same when all the light and heat falling on the eggs is made to reach them only from beneath, as I have proved by keeping them over mirrors, while the upper surface was kept cool by evaporation. It seems to be an affair of gravitation, as in the avian and batrachian egg. As the mature larva escapes from the free surface of the shell with the back of the thorax first, in those eggs which have been kept in the reverse position, and in which the venter of the larva has developed next the free surface, the young larva is obliged to make a half revolution on its long axis within the shell, before it can burst the latter and escape out of it. It *twists* itself round, bringing into view the abdominal spiracles in a spiral line and the four conspicuous warts on the dorsum, to be presently described as the "thoracic square."

* This statement is only absolute for eggs laid evenly on a horizontal surface, and kept in the same position throughout incubation. Even then, individual exceptions will be met with, as in the still rarer case of the cephalic and caudal ends lying the contrary way.—J. A. O.

The period of incubation varies, within my observation, from fourteen days to six, according to the season and the temperature. The first eggs I obtained this year were laid on the 6th of April, and hatched out on the 20th. In 1877 I had eggs in the third week in August (the warmest in that year), which hatched in six days. From that date the period of incubation gradually increased again to eight and eight and a half days. When hatching is imminent, a sudden and obvious change comes over the batch of eggs; the clear yellow colour has given place to a darker muddy discolouration, due apparently to the development of black warts and spiracles and oblique lines of hairs on the body of the larva, and to the complete detachment of the larva itself from the enclosing shell. Conspicuous at this stage, on the dorsal surface, are four relatively large, somewhat triangularly-shaped, blackish spots (warts) seated on the meso- and meta-thorax in a quadrate form, and which I call the *thoracic square*. Within and behind these are, on either side the median line, two rows of black hairs, appressed, and running obliquely backwards and inwards. In front of the thoracic square the head of the larva is noticeable by its translucency, while the slightest inclination to one side or other brings into view the eye-spots, a group of five reddish points on each side of the head. Seen laterally, and perhaps seen more distinctly at a somewhat earlier stage, because not then liable to be confounded with the antennæ and palpi, these five eye-spots are grouped, four in a diamond whose long axis points obliquely backwards and a little ventrally, whilst the fifth, somewhat further away on the ventral side, seems to lie in the continuation of a concave anteriorly, crescentic line, formed by itself and the two anterior eye-spots of the rhomboid. Assuming the head to be composed originally of annular segments, these three eye-spots would seem to lie on one, the remaining two on that immediately posterior to it.

The larva now exhibits slow but constantly repeated vermicular movements; the mandibles open and shut; the tail is generally recurved towards the dorsum. There is, as it were, a crowding forward, and an endeavour to advance in the shell by vermicular movements chiefly, and in which the legs take no part, while the anal pro-leg is in frequent requisition. The large warts of the thoracic square, armed with double hairs, are constantly sliding backward and forward along the shell. At last, an invisible slit in the longitudinal line of two of these warts on one side is effected, revealed at first only by the slow erection of a hair which has escaped through it. There is a hump or protuberance near the head, seeming to be formed by the prothorax,

though of much greater size than the prothorax alone would account for. On the posterior slope of this protuberance may be seen the thoracic square, while in front the head seems bent down and in towards the sternum. Pressure is thus brought to bear on this region of the shell. The abdomen appears attenuated posteriorly, leaving empty spaces between it and the shell, as if to make up for the increased thickness in the thoracic region. The vermicular movements continue; the anal pro-leg, at first dorsally recurved, moves forward in the shell. A process of the prothorax (which is somewhat more translucent than the other segments of the thorax) is protruded through the opening. It is wedge-shaped, the prothoracic spiracle at its posterior margin—the dorsum broadened, and the prosternum running out in the thin edge of the wedge. In front of it, the larva is nipped in, as it were, at the neck, abruptly to the head, whilst behind, the meso- and metathorax slope off towards the abdomen more gradually. After awhile the head is drawn out, vertex first. The hairs on the head point forwards, those on the other segments backwards, and so oppose a return. Head and shoulders out, it seems to rest awhile. The remainder of the body follows more easily, taking 15 or 20 minutes; but the tail of the larva remains much longer within the now somewhat rounded opening in the clear transparent shell.

The hatching having begun in one or two, others follow, and not in the order in which they were laid, after a longer or shorter interval; but it may be several hours before all are hatched out, although laid within half an hour or a little more. And this extension of the time for a whole batch is still further increased in the successive following metamorphoses. In the meantime, the first hatched larvæ will often attack and destroy the eggs still unhatched, even when not compelled thereto by want of other food. In nearly every batch there will be found a few “residual” eggs—undeveloped or arrested—2 or 3 in general, or half a dozen. Sometimes many more, especially in the batches first laid by a ♀, and towards the end of her career, when, in the latter case, there will generally be found a number of eggs, abnormal in shape and size, smaller and sometimes spherical—all of which never come to anything.

The larva feeds according to the season and the weather, from 12 to 18 days, during which time it moults twice, so dividing the period into three pretty equal stages. After it is fed up it is quiescent for 2 or 3 days before pupation. At the time of the first moult it is from .2 to $2\frac{1}{2}$ mm. long; and 4 to $4\frac{1}{2}$ mm. when it undergoes the second

ecdysis. The old skin splits in the usual way over the dorsum of the thorax, and the new larva comes out yellow and translucent, but soon re-acquiring the sooty black, which is its usual colour. The whole process occupies about 15 or 20 minutes, but may be much longer, especially till the tail is quite free. The mandibles are well seen in the freshly moulted larva. They have five acute reddish teeth, of which the lowermost but one is the largest, and is serrate-edged. The middle one is next in size, and the lowermost of all minute. Before pupation the larvæ creep persistently under any cover they can find, and become fastened slightly to the surface on which they are lying by their own exudations. They then become quiescent, and gradually get contracted and thickened. Just before pupation, however, the larva is somewhat elongated in shape. There is loose infolded skin at the tail end (owing, probably, to crowding forward of the pupa in the old skin). A small longitudinal split occurs over the second thoracic segment, through which the yellow colour of the pupa is very distinctly seen. This split extends forwards, forking at the head, and backwards, and in from 5 to 6 minutes the pupa is free to the tail. The anterior portion of the alimentary canal may be seen withdrawn from the mouth—a short tube with a black speck generally at the end of it. The posterior portion of the gut, however, is not cast off so soon, and 5 or 6 minutes more elapse before the pupa is quite free of the old skin. It is at first elongated and larva-like, but soon becomes broadened and shortened.

The time occupied by the whole batch in going through this metamorphosis is again longer than it took to hatch out, as the hatching itself extended over a considerably longer period than the laying of the eggs. Something again depends upon the season, but apart from this, the tendency of the whole brood to “scatter,” as it were, like shot from a gun, is very obvious. If the 40 or 50 larvæ could be reared safely to this stage, they would probably take considerably over a day to pupate; and as there is a general divergence in the whole batch, there is a much greater straggling in a few individuals.

The pupa, like the eggs, is yellow; as, on the contrary, the body, in the alternating larva and imago stages, is black. This state lasts for about 7 days, and its duration varies less with time and temperature than that of any other condition through which the insect passes—say from 6 days to $7\frac{1}{2}$.

I have not noticed exactly how long the individual imago takes in its exclusion from the pupa-skin—about as long, I should say, as in

the moulting of the larva. The batch, however, is considerably longer in going through the last metamorphosis than it was in changing from larvæ to pupæ. As usual, the main body come more closely together, while there are loose stragglers both before and after. Nor do the pupæ become beetles in the same order in which they became pupæ.

The newly excluded beetle is at first pale yellow, with the exception of the parts above mentioned, but soon acquires its natural colours. The elytra are so soft at first, that impressions may be made on them which they will retain ever afterwards, as, for example, by lying on a hard smooth surface, such as that of delf.

Male and female are not to be distinguished with any certainty at first, at least by external marks alone, and it is only by the gradual development of gastrophysm in the ♀ that the sexes can be discriminated. By separating the beetles, however, in the order of their exclusion, I have found that in a batch the females are, on the whole, the first to be excluded. In one lot, for example, of 31 beetles, I placed the first 12 in the order of their exclusion in 12 boxes, correspondingly numbered; and of the remainder (disclosed the following day) six of the largest and best developed were similarly isolated. Of the first 12 all turned out females but the 10th and 11th; whilst among the latter six there was only one ♀.

These observations were made with the further object of watching the development and progress of gastrophysm in each beetle. I must recall that there are four abdominal spiracles on each side, situated on the first four abdominal segments of the imago; and as the abdomen enlarges and its dorsal segments become convex, not only the pygidium and the margins of the abdomen are uncovered, but spiracle after spiracle comes into view, and is left behind by the retreating margins of the elytra, until the fourth (reckoning from behind) is fully exposed. Then, and not before, the first eggs will be laid. The development of gastrophysm occupies from 8 or 9 to 11 or 12 days, according to the season.

With the laying of the first eggs the cycle is complete, from egg to egg again; and the whole period so occupied I found to be at the shortest 39 days—ordinarily about 6 weeks—and in colder weather extending over a considerably longer time.

The union of the sexes in those beetles which are to pass the winter, would seem to be deferred till the following spring. This is rather a prolonged business, when it does take place, and is frequently repeated when opportunity serves, but once sufficiently effected, no further re-union is necessary to the continued fertility of the ♀. On the other hand, the same ♂ seems to be capable of fertilizing many females in succession.

The virgin beetle lays eggs, as far as I know, in the same numbers, and with the same frequency, as the impregnated ♀, but these eggs are almost uniformly barren. One instance I have met with of a single egg, among several hundreds laid by a ♀ which I bred myself, and kept isolated from her exclusion, going through all the stages of development within the shell, till the time for hatching arrived, when it perished. I have given the particulars in "Nature," vol. xx, p. 430.*

Milford, Letterkenny, Ireland :
25th May, 1880.

ANARTA MELANOPA AT HOME.

BY MRS. J. FRASER.

This pretty little moth abounds on the tops of many of the Scottish mountains. In Perthshire I have found it on every Ben which I have ascended to the height of two thousand feet and upwards, during May and early June. It is not among the lovely mountain wild flowers nor yet on the heather that it is found, but when the altitude is reached where the heather grows thin and sparse and the grey lichen takes its place as a covering to the surface, there *Anarta melanopa* may be seen flying rapidly in the sunshine, or even on sunless days if the air be mild. On at least two mountain tops where *melanopa* exists in large numbers, the rocks are of a peculiar grey colour, which matches perfectly with the upper wing of the insect, and in those two localities I observed that it almost invariably alighted on the rock and was then all but invisible. Very rarely did it rest on the lichen, and although the resemblance in colour of the moth to the grey lichen was very great, it was not so perfect as the resemblance between the moth and the rocks, the latter thus affording a more perfect concealment while at rest. In other localities where the rocks are of a colour unlike the upper wing of *melanopa*, it invariably, as far as I could see, settled on the lichen-covered ground, and I did not see a single specimen alight on either rock or stone.

I have never in any locality observed *melanopa* lower down than where the lichen begins to take the place of other plants, and on a mountain side in May or early June with a hot sun and a cool fresh wind blowing over snowy peaks, it is a gladsome sight to see this pretty moth, which, with the ptarmigan, the dotterel, and the mountain hare, are almost the only living things to be seen.

18, Moray Terrace, Edinburgh :
28th June, 1880.

* The results of observations in which I am still engaged enable me amply to confirm this statement, and to prove that parthenogenesis in this species up to the hatching out of the larvæ does occasionally occur.—J. A. O.

NEW SPECIES OF *ACANTHODERES* (COLEOPTERA, LONGICORNIA,
FAMILY LAMIADÆ).

BY H. W. BATES, F.L.S.

The genus *Acanthoderes* is interesting from its peculiar geographical distribution. Having its head quarters in Tropical America, a few outlying species are found in Western Africa, and in the temperate zones of North America, Asia, and Europe. The chief European representative is the well-known *A. varius*, which seems to stand in the relation of a "synthetic" type to the divergent and wonderfully-varied specific forms, undoubtedly congeneric, which abound in South America.

ACANTHODERES VETUSTUS.

Elongato-oblongus, sub-depressus, rufescenti-fuscus, elytris litura circumflexa pone medium, guttisque numerosis, atro-fuscis; lineis obliquis (quarum duabus utrinque angulariter dispositis prope basin, alteraque angulari prope apicem) guttisque apud suturam et latera, cinereis; thorace tuberculis dorsalibus (duobus) lateralibusque validis, his cinereo-cinctis; elytris cristis basalibus serratis, carina dorsali nulla; dorso sparsim punctatis, apice sinuatim transverse truncatis, angulo suturali prominulo, exteriori spiniformi: antennis corpore multo longioribus, articulis 3—6, cinereo-biannulatis, 7—11, basi cinereis: tarsis rufescenti-cinereis, posticis angustis, articulo primo elongato.

Long. 6—8½ lin., ♀.

South Brazil and Ecuador (Macas, Buckley). Belongs to a group of species of similar elongated form and variegated markings, which have slender hind tarsi and rather narrow mesosternum.

ACANTHODERES LONGITARSIS.

Valde elongatus, convexus, rufescenti-fuscus, nigro-punctatus, lituraque circumflexa elytrorum pone medium nigra: thorace tuberculis validis: elytris medio longitudinaliter costatis, tuberculis parvis acutis asperatis, apice truncatis et utrinque æqualiter bidentatis: tarsis fulvis, posticis articulo primo gracili, quàm 2 et 3 conjunctis multo longiori.

Long. 12½ lin., ♂.

Ecuador (from the Saundersian collection). In this species, the length and slenderness of the first joint of the hind tarsi reaches its maximum. The elytra have no trace of the cinereous lines which distinguish *A. vetustus*; the antennæ are ringed with cinereous or fulvous in a similar manner in all the allied species.

ACANTHODERES SATANAS.

A. Swederi proxime affinis at major, præcipue robustior. Latissimus, niger, opacus; capite (prope labrum) maculis duabus minutis, thoraceque lateralibus duabus fere obsoletis, flavis: elytris apice rotundatis, maculis flavis utrinque duabus (altera suturali altera laterali), guttis duabus ad basin, alterisque (duabus vel tribus) sub-obsoletis ad apicem: pedibus validissimis nigris, tarsis latis, articulis 3 et 4 fulvis: pectore immaculato.

Long. 8 lin., ♂.

Chanhamayo, Peru (Thamm).

ACANTHODERES THAMMI.

A. rubripedi (Bates) *simillimus*, at differt antennarum articulis 3^{to} et 4^{to} linearibus-compressis, apice nullo modo dilatatis. Castaneo-fuscus, late croceo-maculatus, pedibus antennisque rubris, femoribus tibiisque basi et apice nigris, tarsis aureo-fulvis, articulo basali obscuriori: maculis croceis ita dispositis:—apud frontem, genas et occipitem utrinque macula una; ad thoracis latera utrinque maculae magnae duae, et (medio dorso) duae minores: ad elytras utrinque circa decem, quarum quinque majores: elytris apice recte truncatis, angulis exterioribus vix productis: corpore subtus lateribus croceo-maculato.

Long. 7—8½ lin., ♂ ♀.

Chanhamayo, Peru (Thamm).

This handsome species of the *Swederi* group is distinguished from rufescent varieties of *A. Swederi* by the second joint of the tarsi being always golden-tawny like the 3rd and 4th. It is, besides, a larger and more robust insect, with shorter and stouter legs, and the spots are larger and of a richer deeper yellow than in *Swederi*: the two discoidal spots of the thorax are always present, in other respects the number and position of the spots both above and beneath are very similar in the two species.

ACANTHODERES ZONATUS.

A. Swederi affinis: castaneo-rufus, tenuissime aureo-tomentosus, elytris fascia recta paulo ante medium guttis nonnullis basin versus et post medium, pallide flavis: antennis articulis 3—6 apice, 7—11 totis, atro-fuscis, 3—4 apice leviter incrassatis, 8—11 abbreviatis: tibiis anticis apicem versus (praecipue extus) conspicue dilatatis: pedibus rubris, genubus tibiisque apice atro-fuscis, tarsis melleo-fulvis: corpore subtus atro-fusco, griseo-pubescenti, lateribus (fere ut in *A. Swederi*) flavo-maculato.

Long. 7 lin., ♀.

Cauca Valley, near Granada.

In the dilated apices of the 3rd and 4th antennal joints, and the diminished length of joints 8—11, and in the expanded apices of the fore tibiae in the ♀, this well marked species agrees with *A. rubripes* and *brevicollis*, of Nicaragua, and differs from *A. Swederi*. The exceedingly close resemblance of these species, notwithstanding the abrupt structural modifications, is well worthy of note.

ACANTHODERES SUBTESSELLATUS.

A. Swederi paullo longior: niger, subopacus, thorace lateribus elytrisque plagiatis albis; partibus albis nigro-punctatis et laciniatis apud elytras fascias duas adumbrantibus, viz., altera obliqua ab humeris ducta, altera apicem versus: capite maculis sex (ut in *A. Swederi* sitis) albis: thorace fere impunctato: elytris basin versus sparsim aspere punctatis, apice transversim flexuoso-truncatis; angulis exterioribus paullo productis: corpore subtus nigro, albo-maculato; tibiis medio albis, tarsis articulis 3—4 aureo-fulvis: antennis ut in *A. Swederi* articulis 3—4 usque ad apicem linearibus, sed differt articulo 11^{mo} (♂) precedenti breviori.

Long. 5—6½ lin., ♂.

Ecuador (Buckley).

Another very distinct species of the *Swederi* group.

ACANTHODERES LETIFICUS.

Oblongo-ovatus, niger, subnitidus, thorace elytrisque ad latera plagis magnis laciniatis fulvo-rufis cinereo-marginatis; elytris juxta suturam cinereo-tessellatis, dorso planatis, carinis longitudinalibus obtusis, apice longissime utrinque spinosis: thorace tuberculis lateralibus et dorsalibus minime elevatis, his a linea dorsali punctis plurimis separatis: antennis articulis 3—11 apice setis rigidis acuminatis, basi griseis: corpore subtus pedibusque nigris, griseo-sericeis: mesosterno lato, bituberculato: tibiis anticis simplicibus. Long. 6 lin., ♀.

Ecuador (Buckley).

An extremely pretty species, distinguished, besides its colours, by the very long apical spine of the elytra and the scarcely prominent thoracic tubercles.

ACANTHODERES LUCTUOSUS.

Elongatus, postice angustatus, supra albus, nigro-fasciatus et maculatus, subtus niger, abdomine utrinque albo-vittato; pedibus nigris, femorum tibiisque basi rufis, harum medio albo-annulato; tarsis nigris, posticis articulo primo basi griseo; antennis nigris, articulis 2—8 basi carneo-griseis: capite nigro, vitta lata mediana (usque ad labrum extensa et medio nigra) alba: thorace vittis tribus nigris, tuberculis validissimis: scutello nigro lateribus albis: elytris carinis dorsalibus valde elevatis antice ad basin porrectis, apice recte sinuatum truncatis, angulis exterioribus paullo productis, vittis nigris valde dentatis obliquis tribus, 1^{ma} ab humero valde obliqua versus suturam, 2^{nda} post medium fere transversa, 3^{ia} prope apicem; macula utrinque medio basi, altera medio margine, nigris; antennis articulis 8—11 abbreviatis, ♂ fere ovatis et intus ciliatis; tibiis anticis utroque sexu extus apice valde dilatatis.

Long. 8—9 lin., ♂ ♀.

Rio Janeiro, Brazil.

This common Brazilian insect, known in collections under the catalogue name here adopted, has, I believe, never been described.

ACANTHODERES PUPILLATUS.

A. luctuosæ quoad formam simillimus, sed aliter coloratus. Pallide fusco-griseus, lituris albo-griseis plus minusve variegatus; prothorace maculis rotundis quatuor, elytris utrinque septem, scutelloque medio, nigro-velutinis: femoribus tibiisque basi, tarsis articulo unguiculari, antennarum articulis 3—9 basi, carneo-griseis; tibiis griseo-annulatis, anticis simplicibus: antennis articulis apicalibus paullo abbreviatis, ♂ haud ovatis, intus dense ciliatis; elytris humeris subfalcatis.

Long. 7½—10 lin., ♂ ♀.

Venezuela and New Granada.

Also a well-known insect in collections, and not previously described. I have adopted the name given to it in MS. by M. Chevrolat. In form, and in the thoracic tubercles and prominent elytral carinæ, it agrees with *A. luctuosus*, and with the genus *Discopus*. The ciliation of the apical joints of the antennæ, and the dilatation of the anterior tibiæ are possessed in minor degree by the European *A. varius*.

ACANTHODERES ABSTERSUS.

A. pupillato proxime affinis et similis, sed differt colore clare griseo maculisque nigris majoribus. Latior, clare griseus, opacus, thorace maculis quatuor, elytris utrinque maculis sex majoribus (tribus marginalibus, duabus ante medium a carinâ

separatis, sexta multo majori extus carinam post medium) nigro-velutinis: antennis griseis, articulis 4—8 apice, 9—11 totis, nigris; pedibus griseis, tibiis annulis duobus, tarsis articulis 2—3 nigris: elytris (ut in A. pupillato) subtrigonis, apice sinuato truncatis, carina fortissima basi conice porrecta. Long. $8\frac{1}{2}$ lin., ♀.

Cauca Valley, New Granada.

ACANTHODERES LEUCODRYAS.

A. luctuoso affinis sed magis convexus: niger, supra opacus, elytris (margine basali maculisque duabus marginalibus tertiaque apicali nigris exceptis) albis, nigro piperatis: antennis (♀) brevibus, articulis 4—7 griseis, pedibus nigris nitidis, tibiis annulo mediano, tarsis articulis 1 et 4 griseis: thorace carina mediana valde elevata et compressa, tuberculis dorsalibus bicuspidatis. Long. $7\frac{1}{2}$ lin., ♀.

R. Morona, Ecuador (Buckley).

ACANTHODERES FLEXISTIGMA.

Oblongo-ovatus, fuliginеus, supra rufescenti-fuscus, elytris guttulis plurimis, fascia lata undata post medium, alteraque angusta prope apicem, nigris; antennis pedibusque nigris, illis articulis 3—11 basi cinereis, tarsis griseo-sericeis; tibiis anticis (♀) extus dilatato-compressis: oculis infra magnis grosse granulatis: capite thoraceque passim punctatis, hoc tuberculis dorsalibus vix elevatis, lateralibus parvis; elytris passim (basi aspere) punctatis, carina basali obtusa, apice breviter oblique truncatis. Long. 7 lin., ♀.

Pará (Henderson).

ACANTHODERES CARINICOLLIS.

Oblongo-ovatus, ochraceo-fuscus, nigro-punctatus; elytris fasciis tribus ochraceo-cinereis, viz., 1^{ma} post scutellum extus abbreviata, 2^{nda} valde obliqua a mediâ suturâ humeros versus extensa ibique bifurcata, 3^{ma} transversa ante apicem: thorace medio longitudinaliter acute carinato, tuberculis disci parvis, lateralibus conicis robustis: elytris postice gradatim angustatis, apice sinuatim truncatis, angulis exterioribus dentiformibus oblique porrectis; dorso utrinque tri-carinatis, carinis nigro-maculatis: antennis (normalibus) pedibusque ochraceo-fuscis, inconspicue variegatis: tibiis anticis extus gradatim compresso-dilatatis: abdomine medio nigro-nitido. Long. 5 lin.

Brazil.

ACANTHODERES CROCOSTIGMA.

Latus, supra olivaceo-ochraceus, capite thoraceque lateribus, fasciolisque elytrorum duabus macularibus, flavis: fronte lato, sparse punctato; oculis parvis transversis; thorace sparsim grosse punctato, tuberculis lateralibus magnis et acutis, dorsalibus vix elevatis; scutello nigro: elytris apice brevissime et obtuse truncatis, dorso utrinque obtuse carinatis basin versus sparsim tuberculatis; guttis flavis præcipue in fasciolas duas digestis, viz., 1^{ma} laterali (e guttis rotundatis tribus) paullo obliqua, ante medium, 2^{nda} (e guttis duabus reniformibus) transversa ante apicem; sutura autem flavo-maculata guttaque parva prope apicem; antennis brevibus castaneis, articulo 4^{to} dimidio basali albo, 5—11 brevissimis: pedibus castaneis, tibiis annulo flavo: corpore subtus nigro nitido, abdomine utrinque flavo-maculato: tibiis anticis simplicibus. Long. 8 lin., ♀.

R. Morona, Ecuador (Buckley).

By the structure of the antennæ, this species would belong to the genus *Scleronotus*, but all the other characters of the insect are those of *Acanthoderes*.

Bartholomew Road, Kentish Town, N.W.:
July, 1880.

NOTES ON SOME *NEUROPTERA-PLANIPENNIA* DESCRIBED BY
THE LATE MONS. A.-EDOUARD PICTET, IN HIS "NÉVROPTÈRES
D'ESPAGNE" (1865).

BY R. McLACHLAN, F.R.S., &c.

I have had the opportunity of studying certain of the late A.-E. Pictet's types, and subjoin the following notes :

Sialis nigripes, Ed. Pict., p. 52, pl. iv, figs. 1—5.—I do not find any differences whatever between this and *S. fuliginosa*, Pict. (père). The legs are not "glabres," as is stated, but finely pubescent, as is usual. The size is very small (the ♂ sometimes expanding to only 20 mm.). I have an equally small form of *S. lutaria* taken by the late Chev. V. Ghiliani at a great elevation on the confines of Piedmont and Canton Valais. I regard *S. nigripes* as identical with *S. fuliginosa*.

Chrysopa microcephala (Brauer), Ed. Pict., p. 60.—The examples are no doubt specifically identical with Brauer's insect. They are compared with *Ch. alba* in Pictet's description, but the real affinity is with *vulgaris*, and I know that Dr. Brauer is now of opinion that *microcephala* may be only a pale whitish form of *vulgaris*, which opinion I share. The former differs principally in the absence of reddish suffusion on the face, in a few of the basal nervules being slightly blackish at one end (those at the base of the costal area included), and in the dividing nervule of the third cubital cellule being often (not always) interstitiate with the nervule above it (instead of ending before it).

Chrysopa nigro-punctata, Ed. Pict., p. 60, pl. viii, fig. 4.—Certainly a good species. Of the three examples one wants the spots on the mesonotum and metanotum (as is indicated by Hagen in Stett. Zeit., 1866, p. 300), but has those on the pronotum. I saw a similar example from Barcelona forwarded by Sen. Cuni y Martorell.

Chrysopa viridana (Schneider), Ed. Pict., p. 61.—I think there can be no doubt as to the identity of the examples with Schneider's species, and Hagen is also of that opinion. Schneider's types were from near Naples. Pictet found it at Grenada, and at Eaux Bonnes in the French Pyrenees. I have an example from near Quillan, Aude (Eaton). In this (as also in Pictet's specimen from Eaux Bonnes) the costal nervules, &c., are not totally black, but have a pale median space.

Chrysopa geniculata, Ed. Pict., p. 62, pl. vii, figs. 5—8.—I do not feel sure that this is anything more than a small example of *viridana*. Only one individual was found.

Chrysopa Meyeri, Ed. Pict., p. 62, pl. viii, figs. 5—8.—Of the two

examples so labelled (both from the Pyrenees) one is perhaps *Ch. alba*, and does not agree with the description. The other, which must be regarded as the type, is very closely allied to *nigro-punctata*, and appears to differ chiefly in the face being suffused with sanguineous at the sides (indicated in fig. 7, but not in the description): this suffusion is still more strongly indicated in an example from Laruns, Basses Pyrénées (Eaton), in my collection. One should see long series of both *nigro-punctata* and *Meyeri* in order to ascertain if they be really distinct.

Chrysopa gadarramensis, Ed. Pict., p. 65, pl. vi, figs. 1—4.—I know not why neither Pictet nor Hagen (Stett. Zeit., 1866, p. 298) notices the very obvious relationship to *Ch. flava*, Scop. (*vittata*, Schnd., nec Wesmael), of which it has the characteristic strong excision of the costal margin of the anterior-wings (not sufficiently indicated in Pictet's figure). It may be distinct, or it may be only a local form of *flava*. The colour is paler, the pronotum has a distinct brown line on either side anteriorly, which I do not see in *flava*, the nervules more strongly spotted with black at the end, the gradate series almost wholly black. The individual is a ♀. Pictet compares it with *pallens*, Rambur, which appears to be *septempunctata*.

Chrysopa thoracica, Ed. Pict., p. 67, pl. vi, figs. 9—12.—Belongs to the group of forms in which there is a black spot between the antennæ, and a black dot at the extreme base of the costa in the anterior-wings. I have seen only one example, which is quite distinct from anything known to me, differing in the absence of spots on the top of the head, in the lunate red mark on the face below the base of each antenna, &c. The name *thoracica* was applied by Walker in 1853 (Cat. Brit. Mus. *Neurop.*, pt. ii, p. 243) to a *Chrysopa* from St. Domingo, hence it becomes necessary to rename Pictet's insect:—I propose the term *Picteti*.

Chrysopa Zelleri (Schneider), Ed. Pict., p. 68.—Whether *Zelleri* is anything more than a form of the variable *aspersa* may be doubtful. The two posterior occipital points are smaller in Pictet's examples than in others I have from Zeller. The spot on the basal joint of the antennæ may be above, or outside, or absent altogether. I remark that a type of *Ramburii*, Costa, in my collection, is *Zelleri* and not ordinary *aspersa*; *neglectus*, Costa, is also evidently *Zelleri* from the description, as Hagen has already determined.

Chrysopa clathrata, Ed. Pict., p. 68.—I have three examples before me. They are certainly distinct from Schneider's *clathrata* from

Italy, Sicily, Dalmatia, &c. Taking the colour generally, as in dry examples, *clathrata* may be distinctly termed a dark insect, and *clathrata*, Pict., a pale one. The true *clathrata* has the sides of the thorax broadly margined with dark fuscous, the costal nervules entirely blackish or nearly so, and the other nervules with only a short pale median space. In Pictet's species the colour of the markings on the body is reddish-brown, the bands on thorax are not lateral, but sub-lateral, in the form of lines, leaving the margins pale; the nervules are much less marked with black, and in all cases (excepting the gradate series) only as a point at either end: the whole form is less robust; the markings on the face also differ, none of Pictet's examples show the spot between the antennæ of which he speaks (and it is not frequent in the true *clathrata*); the basal joint of the antennæ has often a brown line externally. I have seen Pictet's insect from no other quarter, and propose for it the name *lineolata*.

Chrysopa granadensis, Ed. Pict., p. 69, pl. vi, figs. 5—8.—A small species described from a single example. Apparently quite distinct. Possibly allied to *lineolata*.

Chrysopa riparia, Ed. Pict., p. 69, pl. vii, figs. 9—12.—Two examples are before me, in very bad condition.

Chrysopa monticola, Ed. Pict., p. 70, pl. vii, figs. 1—4.—From the French Pyrenees. Allied to *riparia*, but apparently distinct. The "tache semi-lunaire rouge devant les yeux" is not apparent in the only type with a head. It is probable that *nigro-punctata*, *Meyeri*, *riparia*, and *monticola* belong to the same group as *flavifrons* (Brauer), in which there is a black or brown dot at the extreme base of the costa in the anterior-wings, but no spot between the antennæ.

Chrysopa venosa (Rambur), Ed. Pict., p. 72.—One of the few species with simple claws. Otherwise this species has the form and facies of *Ch. perla*, and is allied thereto.

Chrysopa italica (Rossi), Ed. Pictet, p. 72.—This, as is well known, belongs to my genus *Nothochrysa*. It was not taken by Pictet, and I mention it only in order to call attention to a curious structure seen in an example once forwarded by Dr. Bolivar, of Madrid. In the abdomen of one sex (probably the ♂) there are concealed two long curved spines in a pouch between two of the apical ventral segments. I have seen them in no other example, owing to the pouch being closed, and neglected to take an exact description when the individual was before me.

DESCRIPTION OF THE NYMPH AND IMAGO OF *PSYLLA PEREGRINA*, FÖRST.

BY JOHN SCOTT.

In vol. xiii, p. 137, of this magazine, I recorded, with a query, the capture of a single female of this species, and it was only in August, 1876, that I was enabled to remove the doubt by the capture of a number of specimens of both sexes on the dogwood (*Cornus sanguineus*). Since that time I have, on two or three occasions, taken the species on the same bushes, but I never was fortunate enough to meet with it in its earlier stages. This circumstance made me somewhat incredulous as to the dogwood being really its food-plant, and so, before committing anything to paper, I resolved to wait patiently, until I had solved the question. This waiting has brought about the desired result, for, at the meeting of the K. K. zool.-bot. Gesellschaft in Wien, held on the 5th November last, Dr. Franz Löw laid before it a part of his "Mittheilungen über Psylloiden," in which, at p. 573, of the "Verhandlungen," he describes the insect in its stages of nymph and imago. He there states that he found it on hawthorn (*Cratægus oxyacantha*), and, accordingly, I set myself to work to determine this point. Towards the end of May I began my search, and, since then, down to the date on which I now write, I have both captured on, and beaten the young and perfect insect from, the twigs of the above-named tree, as stated by him. The synonymy will stand thus:—

Psylla peregrina, Först., F. Löw.

„ *carpini*, Först.

„ *cratægicola*, Flor (*nec* Först.).

The *Ps. cratægicola*, Först., being the same as *Ps. mali*, Schmidberger and Förster.

Nymph green, oval, shining, not clothed with hairs. *Antennæ* yellowish, two or three apical joints black. *Elytra*—lobes pale yellowish, very finely wrinkled, with a brown, longitudinal streak down the middle, widest next the apex, and frequently indistinctly reaching the base. *Legs* pale greenish or yellowish, or the thighs only greenish. *Tarsi* brown. *Abdomen* above, green, round the apex scalloped, the extremities of each scallop bearing a longish, stout, pale hair; number of hairs 14; the upper scallop on each side wider than the others; underneath green.

Imago: summer brood green or greenish-yellow, rarely yellow; autumn brood clear red or reddish-yellow. *Head* green or greenish-yellow, or clear red or reddish-yellow; *crown*: posterior margin concave, width between the eyes about twice the length measured down the centre. *Face*—lobes pale green or yellow, reddish or reddish-yellow; with a few pale hairs next the apex; exterior margin concave, interior margin slightly convex, apex somewhat acute and

rounded, divergence not equal to the base of either, length a little greater than the breadth across the base. *Antennæ* yellowish, 9—10 joints black.

Thorax green or greenish-yellow, rarely yellow, clear red, or reddish-yellow; *pronotum*, in the latter cases the anterior portion (*dorsulum*) meso- and *metathorax* frequently darkest on the disc. *Elytra* clear, transparent, scarcely $2\frac{2}{3}$ times as long as broad, nerves yellowish, frequently somewhat dusky, especially towards the apex; stigma moderate in width at the base, terminating about in a line with the middle of the area (*cubitalis costæ*), measured on the marginal nerve, enclosed between the furcations of the cubitus; radius extending to the apex, concave towards the costal margin in a line with the apex of the stigma, and recurving before its termination in the marginal nerve. *Legs* pale green, yellowish or reddish-yellow. *Thighs*, in the autumn brood, red. *Tarsi* brown.

♂. *Abdomen* above, green or dark brown, genitalia yellow, or reddish-yellow, genital plate, inner margin concave next the apex, convex towards the base, processes about three times as high as broad at the base, narrowest at the apex, which is black, posterior margin with a gentle wave.

♀. *Abdomen* green; upper genital plate brownish, lower green. Length, $1\frac{1}{4}$ lin.

Lee: 7th June, 1880.

[*Psylla peregrina* was found by me in Scotland in August, 1876, not scarce on the mountain-ash (*Pyrus aucuparia*), a tree of the same Natural Order as the hawthorn.—J. W. D.]

NOTES ON TENTHREDINIDÆ.

BY P. CAMERON.

(Continued from vol. xvi, p. 267).

ATHALIA SCUTELLARIÆ, sp. nov.

Luteous, pilose, the head (except the apex of clypeus and the labrum, which are white), meso- and metanotum (except the apex of middle lobe of mesonotum, and the greater part of scutellum, which are luteous), and the upper half (in some cases only the third) of pleuræ, black. Legs luteous, the apices of the four posterior tibiæ, and the joints of all the tarsi broadly annulated with black. *Antennæ* black, 11-jointed, testaceous on the under-side. Wings hyaline, nervures, costa (save at extreme base, where they are testaceous) and stigma black: ♂ similar, but with mesonotum entirely black.

Length, $2-2\frac{1}{4}$ lines. Alar exp., $4\frac{3}{4}-5$ lines.

Allied to *A. rosæ*, but distinguished by its smaller size, more pilose body, luteous sternum and scutellum in the ♀, by the 3rd sub-marginal cellule being shorter in proportion to the 2nd, and at the same time wider at the base, by the 3rd joint of the antennæ being more than double the length of 4th, which is not the case with *rosæ*, while the tarsal joints at the base are of the same colour as the rest of the legs, and not whitish as in the Linnean species.

A. ancilla, Lep. (*glabricollis*, Thoms.), differs from it in its shining, glabrous thorax, in the pleuræ being entirely luteous, the antennæ more clavate, &c.

For this species I am indebted to Mr. Allen Harker, who sent me the larvæ last autumn from near Gloucester, where he found them feeding on *Scutellaria galericulata*, and from these I succeeded in rearing the perfect insects during the last week in June.

The larva is of a deep velvety black colour. On the sides at the top are twelve white tubercles, which are longer than broad; over the legs there is a row of larger and more oval tubercles of the same colour, while above these, on the abdomen, there is a row of smaller white tubercles situated above the space separating the larger ones below them, this middle row of tubercles being of the same shape as those on the top. The head is deep black, and covered with a moderately long pile; the legs are fuscous-black, the abdominal legs white, or dirty white. The skin is rough, and of a velvety texture. In habits and mode of pupation, it does not differ from the other *Athalia* larvæ.

It is, I believe, the larva of *scutellarix* which Dahlbom figures as that of *A. annulata* in his Prod. Hymen. Scand., pl. ii, f. 44. The arrangement of the tubercles is the same, but he gives the colour of the body as glaucous. The food-plant of the larva is not mentioned, but the imago is stated (*l. c.*, p. 67) by Drewsen (from whom Dahlbom received the larva in spirit from which his figure was taken) to frequent *Brassica rapa*, in July. A totally different account is, however, given of the larva of *A. annulata* by Kaltenbach, who says that it is dull black, whitish on the sides, and that it feeds on *Veronica beccabunga* (Pflanzenfeinde, p. 471).

Glasgow: July, 1880.

(To be continued).

Captures near Hastings.—The following notes contain the record of the best things I have met with amongst the *Coleoptera* and *Hemiptera* in the neighbourhood of Hastings during the past three years.

COLEOPTERA.

Harpalus servus—one at roots of coarse herbage on Camber sandhills at the mouth of the Rother, in July, 1879.

Hydroporus latus—one at Hollington, in June, 1879.

Staphylinus latebricola—one at roots of heather at Darvel's Hole, near Netherfield, in April, 1879.

Cyrtusa pauxilla—occasionally at Newgate Wood and Guestling.

Odontæus mobilicornis—two in 1877, one near Hollington, the other at Guestling.

Athous difformis—two ♂ and one ♀ in June, 1878, at Hastings, close to the town.

Priobium castaneum—not unfrequently at Hastings, Guestling, and Fairlight.

Mordellistena abdominalis—one ♂ at Guestling in 1877. I have also a ♀ which I believe came from Hollington.

Prionus coriarius—several near Hollington in 1877.

Lycoperdina bovistæ—one in a decaying stump at Hollington Wood in April, 1878.

Notoxus monoceros—very common at Camber, and amongst a large number of specimens taken there was one which had the thoracic horn bifurcate in front.

HEMIPTERA-HETEROPTERA.

Sehirus biguttatus—two or three specimens in woods near Battle and Guestling.

Eusarcoris melanocephalus—common at Hawkhurst in May, 1877.

Zicrona cærulea—several amongst heather at Darvel's Hole, September, 1879.

Chorosoma Schillingi—common by sweeping amongst coarse herbage at Camber sandhills in September.

Berytus crassipes—one by sweeping amongst heather at Fairlight, September, 1878.

Acetropis Gimmerthali—three amongst long grass at Fairlight, September, 1879.

Miridius quadrivirgatus—several near Hastings, 1878 and 1879.

Calocoris infusus—several on palings near Hastings, 1879.

Psallus quercus—one in Newgate Wood, July, 1878.

Gerris paludum—a few on reservoirs at Hastings and on dykes at the Salts, Bopeep.

I had the good fortune to capture a *developed* specimen of *Bryocoris pteridis* at Llanwrtyd, Brecknockshire, in August, 1879; the undeveloped form occurred in profusion on different ferns, but I saw only the one developed specimen.—E. A. BUTLER, University Lower School, Hastings: June, 1880.

Notes on Hymenoptera and Hemiptera captured at Chobham.—Although the weather during the last fortnight has not been very favourable for collecting, I have succeeded in finding several rarities which I think worth recording, and amongst these are three new species (to this country) of *Hymenoptera*, belonging to the family *Pompilidæ*. Being away from my collection and books, I cannot now characterize these fully, but I hope to be able to do so in a future number. They are all very distinct species, the ♂ especially being easily recognised.

The first is *Priocnemis parvulus*, Dahlb., which belongs to the group in which our common *exaltatus* occurs, its ♂ may be known at once by the narrow ventral anal plate which is slightly widened towards the apex and truncate; the ♀ may be known by being smaller than *exaltatus*, with the apical segment of the abdomen beneath more or less carinated down the middle, and by having no distinct clear round spot near the apex of the anterior wings as in that species.

The second is *Pompilus neglectus*, Dahlb., of which the ♂ differs from all our British *Pompili* in having the posterior tibiæ sinuate on the side towards the body, and then suddenly incrassated above the apex; its ♀ can only be confounded with that of *P. spissus*, as it has the anterior tarsi with the short spines like that species, from which it differs in the triangular shape of the third submarginal cell.

The third species is I believe *Pompilus abnormis*, Dahlb., of this I have taken 1 ♂ and I believe 1 ♀. The ♂ may be at once known by the anal ventral plate having a long pendant spine at some little distance from the apex. I have a ♀ which I believe belongs to it, but it is very closely allied to *gibbus*, and I must wait to compare it with that species before being certain.

It may be well to observe that in collecting the species of this family it is

essential that the specimens should not be *carded*, as the ventral segments furnish most important structural characters: all of these species have been found running or flying amongst the heather, &c., on West End Common, Chobham.

I have also found the following, which are more or less rare or worthy of notice, *Leptothorax Nylanderi*, a few by sweeping; *Pompilus cinctellus*, 1 ♀; *Miscophus bicolor*, commonly; *Astata stigma*, 3 ♀; *Harpactus tumidus*, occasionally; *Evagethes bicolor*, occasionally; *Tachytes niger*, occasionally; *Ceropales maculatus*, 1; *Myrmosa melanocephala*, 1 ♂, 3 ♀; *Andrena fucata*, rarely.

HEMIPTERA.—*Leptopterna ferrugata*, 1 developed ♀; *Capsus scutellaris*, pretty commonly by sweeping the heath, mostly of the black variety, but 2 ♂ and 3 ♀ with the red scutellum; *Pithanus Märkeli*, 3 developed ♀, the undeveloped form very abundant in both sexes.—EDWARD SAUNDERS, West End, Chobham; *July 9th*, 1880.

Luciola—the European firefly.—In Mr. Gorham's Revision of *Lampyridæ* (Tr. Ent. Soc., 1880, p. 99), he says that only one sex of *Luciola*, so far as regards the European species, is known to him, and conjectures it may be the female. In this, however, he is mistaken: Mulsant, in the Coléoptères de France, Mollipennes, p. 123 et seq., has indicated correctly the sexes of *Luciola lusitanica*, and, on the authority of M. Peragallo, has stated that the fairy-like swarms of this elegant insect that form so beautiful a feature of the midnight hours of Midsummer in the South of Europe, are composed entirely of males, the female remaining quiet and concealed on the under-surface of a leaf. This fact is quite in accordance with my own observations. Some years ago I passed an evening amongst the fireflies in the Val Anzasca. I captured a good many specimens of them as they were flitting about, and all were males, but I succeeded in getting a female concealed amongst the grass, by searching on the ground at a spot where I saw a small speck of light. This was the only female I found.

M. Mulsant, referring to the observations of MM. Perroud and Arias, states that the interruption of the light is due to undulating movements of the body which alternately conceal and discover the phosphorescent parts.—D. SHARP, Thornhill, Dumfries: *17th July*, 1880.

Euplectus punctatus in Sherwood Forest.—By permission of the Rev. A. Matthews, I have to record the capture of *Euplectus punctatus* in Sherwood Forest some years ago by himself and his brother. I know of no other specimens that have been recorded except the two mentioned in the Ent. Annual for 1869, p. 64. Dr. Sharp kindly determined the species. It is very like *E. Karsteni* at first sight, but is easily distinguished by the fact that the thorax is considerably dilated on each side: it is also larger and more flattened, as Mulsant says in his description. It is quite possible that it may be mixed with *E. Karsteni* in some collections.—W. W. FOWLER, Lincoln: *July 9th*, 1880.

Note on Agrotis saucia.—I have taken a moth which my father thinks I may notice in the Magazine. On the evening of the 3rd of this month I went to the railway embankment to search the flowers of the red Valerian for moths, and much to my

joy caught one which proves to be *Agrotis saucia*. From its appearance it may perhaps have hibernated, but it is not much damaged.—CHARLES G. BARRETT, Jun., Pembroke: *July 12th*, 1880.

Noctua c-nigrum in June.—On the 27th June, at mid-day, I saw, on a walk in the garden, a living *Noctua* which I did not at first recognise, it being in very bad condition; and I was about to leave it, when it occurred to me that it was *N. c-nigrum*, and so, on account of the singularity of its appearance at this season, I killed it and set it out. I can come to no other conclusion than that it is an example that has hibernated, the usual time of the species coming out being late in July and in August; the worn wings show it has survived hard climatic conditions, but its enfeebled state seemed to be the result of an immediately previous encounter with a bird or other enemy.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *14th July*, 1880.

Bapta taminata and *Sesia myopæformis* in Lancashire.—Mr. Anthony Mason of Grange-over-Sands sent me a specimen of *B. taminata* to know if he must catch more of it, as it was a new "carpet" to him, and Mr. Henry Murray, of Carnforth, took *S. myopæformis* sitting among the dust on the road close to the Grange Station, he remarked that he had killed hundreds of flies and ichneumons thinking they were clear-wings; there are some old apple trees, now wild, growing close by: I am not aware of the occurrence of either of those species before in Lancashire.—J. B. HODGKINSON, 15, Spring Bank, Preston: *June 13th*, 1880.

Stigmonota scopariana.—Seven days ago I made a special journey to look for the larva of this species. I had tried the supposed plants that I bred *scopariana* from, but nothing seemed to agree satisfactorily. After reading the hints about its occurrence in rough fields of broom and *Genista*, I put on my studying cap, and remembered bringing a handful of *Genista tinctoria* flowers from a rough field when passing through last July, and I put them in a pot to feed *Depressaria atomella* upon. This was my last hope of getting any results. I was down on my knees poking about among the plant until I was stiff all over, and lying down at full stretch I spied a yellow *Tortrix* larva creeping up the stem, I got it carefully on my net, got out my glass and was satisfied that I had learned the secret, and picked a few more unexpanded buds growing next to the one I got the larva off: out comes my glass and there were holes eaten at the base of the flowers, and snugly inside was another larva which had drawn a leaf up to the stem for shelter—they don't seem at all to eat the leaves; the larva is dark yellow, slightly hairy, and the dorsal vessel shows as a transparent dull brown streak along it; the body is speckled with very minute black spots, the head is of a light horny colour. The larva is moderately active and fat; the pupa is yellow, enclosed in a silken cocoon made up on the covering of the pot; two have changed thus, and three among some of the light soil at the bottom, drawing it over the silken enclosure. I hope to breed these, as I am leaving the district this year; I was fortunately there at the moment, as they made up in a day or two afterwards.—ID.: *July 15th*, 1880.

Note on Cidaria salicata.—In June, 1879, I had some eggs of *salicata* given me by Mr. Threlfall, they hatched in due course, fed up well, went to pupa, 8 moths emerged in August, 1879, 3 in May, 1880, and 4 more up to July 5th, 1880.—ID.

Insects from Portugal.—The Rev. A. E. Eaton has returned from an entomological tour of more than two months' duration in Portugal, in the course of which many localities rarely visited by Englishmen, from north to south of the country, were explored, and much hardship experienced. When the materials have been worked-out they will no doubt prove of very great interest. He collected all Orders, but, naturally, his attention was specially directed to *Neuroptera* (in the broad sense); and this was the more desirable, inasmuch as the Neuropterous Fauna of the country was practically unknown. In his favourite *Ephemeridæ* the materials are extensive, and include quite new forms. The *Trichoptera* are represented by over 500 examples, on a rough estimate, and these he has generously presented to me. A glance at the as yet unprepared material shows that there are certainly many interesting new forms, and a large number of species: curiously enough, the Family *Limnophilidæ*, which may be said to include nearly two-fifths of the European *Trichoptera*, is only just represented; the riches of the collection are concentrated upon *Sericostomatidæ*, *Leptoceridæ*, *Hydropsychidæ*, and *Rhyacophilidæ*. He has also a long and interesting series of terrestrial Isopod *Crustacea*. It is to be hoped that the collections will be worked out by specialists, and the results published in a collective form, so far as may be possible.—R. McLACHLAN, Lewisham: 15th July, 1880.

Elipsocus cyanops, *Rostock*.—The first excursion I made after having introduced this species as British from examples taken by Mr. Fletcher, near Worcester (*ante* p. 21), resulted in the capture of 4 specimens on Tuddenham Heath, Suffolk, and at Snailwell, Cambridgeshire, at the end of June. They also were beaten from *Pinus sylvestris*. It is just possible that the two specimens in Mr. Marshall's collection mentioned in a note under the description of *Cæcilius obsoletus* in my monograph of the British *Psocidæ* (Ent. Mo. Mag., iii, p. 271), belonged to *E. cyanops*.—ID.: 5th July, 1880.

Obituary.

Robert Hislop.—On the 9th June last, at Blair Bank, Polmont, near Falkirk, this Magazine lost one of its earliest supporters by the death of Mr. Robert Hislop. His name came but little before the entomological world, as he was more interested in the immediate aspect of natural science than in viewing the favourite objects of his quiet and steadfast study through a descriptive medium. Some few notes from his pen, usually adding a new northern species to our fauna-list, have appeared in our pages; but only the very few who visited him in his Scotch home know what placid delight he found for many years in investigating the *Coleoptera* of his immediate neighbourhood. On the rare occasions when he came to London, the habitual reserve, partly national and partly acquired by his long professional occupations, fairly gave way when collecting in our more favoured southern woods; and his innate genuine simplicity and delight in the smallest works of creation, fairly asserted themselves. To him, moreover, do most of the present school of southern English Coleopterists owe their earliest acquaintance with Scotch forms: at a time when no one thought of visiting such boreal regions as Rannoch, Falkirk was indeed an "Ultima Thule" for beetle collectors.

But Mr. Hislop's memory stands upon a surer basis than the mere regard of a

few friends and fellow Naturalists. His lofty religious and moral aims, seconded by a peculiar ability for educational purposes, marked him, from early youth, as one who would take foremost rank in that scholastic army which in Scotland especially is recruited from men with the soundest brains and strongest principles. How well he fulfilled that promise, is recorded in the Annals of the Glasgow Normal Seminary, the Free Church Training Schools, and Blair House Academy, Polmont, in all of which his work, for nearly 50 years, was marked by earnest zeal and large-hearted sympathy. Mr. Hislop was born at Dunse in 1815; his eldest brother, the Rev. Alexander Hislop, is known in Scotland as a writer on religious subjects; and another brother, the late Rev. Stephen Hislop, of Nagpore, contributed many papers to our knowledge of the Geology of Central India.

ENTOMOLOGICAL SOCIETY OF LONDON.—July 7th, 1880. J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Mr. Douglas sent for exhibition a ♀ example (possibly hibernated) of *Noctua c-nigrum*, captured on the 27th June.

Mr. Phipson exhibited a very remarkable variety of *Vanessa cardui*, taken last year near Basingstoke.

Mr. Billups exhibited a dead larva of *Plusia chrysis* which had been infested by 120 examples of a parasitic Hymenopterous insect.

Mr. Distant exhibited a very fine example of the so-called vegetable-caterpillar of New Zealand (larva of *Hepialus virescens* with the fructification of *Sphaeria Robertsi*).

Mr. McLachlan exhibited sugar-cane from Queensland much damaged by the larva of a Lepidopterous insect, apparently allied to that (or those) from Brazil, the West Indies, Mauritius, &c., noticed by Fabricius, Guiling, and Westwood, and also to that recently exhibited by Miss Ormerod from British Guiana.

Mr. W. F. Kirby called attention to the description and figure of *Pyrallis saccharalis*, F., published in the Skrif. af Naturh. Selskabet in 1794, and to Guenée's long account in Maillard's "Notes sur l'île de Réunion," in which "Borer" was used as a generic term.

Mr. Distant said the "borer" of Madras was not the same as that described by Guiling.

Miss Ormerod read "Additional Notes on Cane-Borers," with especial reference to *Tomarus bituberculatus*, *Sphenophorus sacchari*, and *Rhyncophorus palmarum*, in concluding which she alluded to more recent reports on the Lepidopterous borer of the Mauritius, and offered suggestions for combating the ravages of the insect enemies of the sugar cane.

Mr. Roland Trimen sent notes on an observation of Colonel Bowker, of Natal, on a butterfly (*Salamis anacardii*, L., ♂) in copulâ with a moth (*Aphelia Apollinaris*, Bdv., ♀), the two insects much resembling each other. Also "Notes on a supposed ♀ of *Dorylus helvolus*, L.," dug out from the nest of a small red ant, near Cape Town.

Mr. Sidney Churchill, of Teheran, communicated lengthy "Notes on the habits of *Argas persicus*, and the effects of its bite."

(No. 10).—Occurs in Oahu. I cannot consider this identified with No. 29; the clear wings separate it at once. The single ♀ I possess has a yellow collar, wanting in same sex of 29, which has the labrum covered with dense silvery pubescence (T. B.).

♂. Length, 4 lines. Resembles *C. unicolor*. Black; abdomen shining; face deeply channelled, eyes much wider apart than in *unicolor*; labrum silvery; top of head more shining than the thorax, but less so than the abdomen; stemmata in a triangle on the vertex. Thorax finely punctured; mesothorax with no distinct longitudinal depression, which exists in *C. unicolor*, but with a transverse ridge before, and two behind, and the metathorax slightly channelled, as in that species. Wings hyaline, but slightly clouded. Abdomen smooth and shining, clothed towards the apex with greyish pubescence (W. F. K.).

25. *Pison widipennis*, Smith.

(No. 40).

26. *Pison hospes*, Smith.

(Nos. 38 & 39).—In writing to Mr. Smith, I did not intend to imply that *Pison* is parasitic, but merely remarked on the circumstance that species of three genera combined in the construction of a single mass of cells (T. B.).

27. *Polistes aurifer*, Sauss.

(Nos. 26 & 27).—Plentiful all over the islands, and stings very severely. Makes nests in various places, usually preferring (as far as my experience goes) a hollow trunk of a tree (T. B.). A well-known Californian species (W. F. K.).

28. *Camponotus sexguttatus*, Mayr.

(Nos. 18, 42, 43).—Common in Honolulu; ♀ common at light in Oahu (T. B.).

29. *Prenolepis clandestina*, Mayr.

(Nos. 19 & 20).—I have found a small nest under a stone near Honolulu, from which I obtained the male, worker, and a single female (T. B.).

30. *Ponera contracta*, Latr.

(Nos. 50 & 51).

31. *Leptogengys insularis*, Smith.

(No. 52).—Honolulu, and the surrounding plains (T. B.).

32. *Tetramorium guineense*, Fabr.

(No. 49).

(as in *O. incongruus*, Smith), which are apparently wanting in the males of *Blackburni*, but which may possibly depend on the attitude of the body at the moment of death (T. B.).

15. *Odynerus Blackburni*, sp. n.

Odynerus rubrivinctus, ♂, Smith.

(No. 33).—I have two males and one female of this species. From Kauai. Allied to the last, and of similar habits (T. B.). In his remarks on the last species, Mr. Blackburn points out the differences between it and the present. In Mr. Smith's description (New Spec. Hym., p. 135, last line) we should evidently read for—"two (spots) beneath wings, frequently united,"—"two (spots) beneath wings, almost united" (W. F. K.).

16. *Odynerus montanus*, Smith.

(Nos. 28 & 41).—Occurs high up on the mountains of Oahu (T. B.).

17. *Odynerus congruus*, Smith.

(Nos. 13 & 14).—Found in company with *Protopis Blackburni*. The wings exhibit a brilliant violet iridescence in certain lights, not mentioned in the description (T. B.).

18. *Odynerus dubiosus*, Smith.

(No. 35).—Common near Honolulu and elsewhere on Oahu (T. B.).
19. *Odynerus agilis*, Smith.
(No. 34).—From Maui. Frequent flowers, but seems to be rare, as I hunted a long time for a series, and only obtained two specimens (T. B.).

20. *Crabro affinis*, Smith.

(No. 36).

21. *Crabro mandibularis*, Smith.

(No. 3).

22. *Crabro denticornis*, Smith.

(Nos. 1 & 2)—Nos. 1—3 taken at flowers on Maui, February, 1878. I believe these to be all one species, as also a single female taken in company with them, having the abdomen much marked with yellow (T. B.).

23. *Crabro unicolor*, Smith.

(No. 29).—Very rare; but occurs on Oahu and Maui, and probably all over the islands (T. B.).

7. *Megachile diligens*, Smith. (No. 23).

8. *Xylocopa cneipennis*, De Geer.

(Nos. 21 & 22).—A common South American insect (W. F. K.). Common near Honolulu, and I think elsewhere. Does much damage by boring holes in trees, timber, &c. (T. B.).

9. *Apis mellifica*, Linné.

(No. 65).—Island of Oahu (T. B.).

10. *Pelopæus flavipes*, Fabr.

(Nos. 16 & 37).—One of the commonest *Hymenoptera* all over the Archipelago. I bred it, as well as *Pison hospes*, and also a species of *Odynerus*, from a single mass of mud cells found adhering to the eaves of an old shed, on Kauai (T. B.).

11. *Odynerus localis*, Smith.

(Nos. 30 & 31).—Common on Kauai. Apparently same habits as *O. maurus*, and may possibly be a variety (T. B.).

12. *Odynerus extraneus*, sp. n.

(No. 32).—♀. Length, $6\frac{1}{2}$ lines. Closely resembles the last species, with which it was confounded by Mr. Smith. Black; head, thorax, and basal segment of abdomen closely and coarsely punctured; but the remainder of the abdomen is black and shining, and very finely punctured. The basal segment is more constricted behind than in *localis*. The first and second segments are bordered behind with pale yellow as in *localis* (not with white, as Smith erroneously states in his description of that species), but the punctures on the second band, which are very distinct in *localis*, are scarcely visible in *extraneus* (W. F. K.).

From Kauai; I do not possess the ♂ (T. B.).

13. *Odynerus maurus*, Smith.

(Nos. 11 & 12).

14. *Odynerus rubritinctus*, Smith.

(No. 15).—Taken in company with *Prosopis Blackburni* in Maui. I possess three specimens, all males. In *O. Blackburni* the wings are light fuscous, with a kind of fuscous iridescence, but with no trace of violet; in *rubritinctus* they have a brilliant violet iridescence. The head, thorax and abdomen are coloured identically in all the specimens of *Blackburni* and *rubritinctus* respectively; the punctuation of *Blackburni* is coarser and more confused than in the other species, especially on the first segment of the abdomen. The males of *rubritinctus* have two long styles projecting from the apex of the abdomen

NOTES ON SPECIES OF ACULEATE HYMENOPTERA OCCURRING
IN THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, M.A., AND W. F. KIRBY.

Some months ago, the Rev. T. Blackburn forwarded a collection of Hawaiian *Hymenoptera* to the British Museum, and most of the new species were described by the late Mr. F. Smith, in Journ. Lin. Soc., xiv, pp. 675—685, and are also included in his posthumous "Descriptions of new species of *Hymenoptera* in the collection of the British Museum," published in the autumn of 1879.

Since that time, Mr. Blackburn has forwarded some additional notes, which I include, at his request, in the present paper (W. F. K.). (Nos. 4 & 5).—If these two are the same species, the sexes differ considerably. This insect is not uncommon at flowers in sandy places on the island of Maui (T. B.).

2. *Prosopeis fuscipennis*, Smith.

(No. 9).—Perhaps generically distinct from the other species. I have a single ♀ not noticeably differing from the ♂, except in the number of joints of antennæ, and in the greater width of the abdomen (T. B.).

3. *Prosopeis facilis*, Smith.

(Nos. 6 & 7).—Fairly common in various localities in the mountains of Oahu (not Maui), generally flying about the face of bare precipices (T. B.).

4. *Prosopeis hilaris*, Smith.

(No. 8).—Occurs in company with *P. blackburni*. I have not seen any specimens which I could regard as the ♀ of this insect (T. B.).

5. *Prosopeis volatilis*, Smith.

(No. 25).—Occurs rarely in Oahu (not Kauai), usually in company with *P. facilis* (T. B.).

6. *Prosopeis flavifrons*, sp. n.

(No. 24).—Length, $2\frac{3}{4}$ lines. Black, wings hyaline and iridescent, clouded towards the extremity. Face below the antennæ bright yellow, antennæ reddish beneath the extremity. Head and thorax dull black, closely punctured. Abdomen shining black, hardly punctured; extremities of the tarsi reddish. This species is ticketed *carbonaria*, Smith; but I cannot find that it has been described; and the specific name has already been used in the genus (W. F. K.). Taken at flowers on Kauai, very sparingly (T. B.).

Catoptria (Graptolitha) tripolianna, n. sp.

Alar exp., 6 to 7 lines. Fore-wings rather elongated, glossy or greasy in appearance, pale yellowish-brown (deal colour), varying either to pale drab, or to dark brown, or even to greyish-brown. Basal blotch indicated by an oblique, pointed, darker brown fascia, extending two-thirds across the wing, but often interrupted in the middle, in which case it forms a wedge-shaped streak between the principal nervures. Central fascia brownish, oblique, more or less indistinct. Ocellus clear and bright, generally containing two thick black lines, rather far apart. Above this the dark colour forms a cloud, reaching from the central fascia to the apex. Costal margin usually dotted all along with faint brown spots, which sometimes run into oblique costal streaks, but very variable in this respect. Cilia glossy, pale brown, with darker clouding, and a dark line at the base. Hind-wings whitish in the ♂, pale grey in the ♀, in both cases clouded with grey along the margin and at the apex. Head and thorax generally clear pale yellowish-brown, but varying with the colour of the fore-wing. Abdomen darker.

Differing from *emulana* in its constantly larger size, rather longer and more pointed fore-wings, which also have a greasy appearance, while those of *emulana* are more powdered or dappled, and in the absence of the "cross-waves" in the basal blotch, which is merely shaded inwards from the fascia. It is also exceedingly variable in shade of colour, and liable to the variation which I have before pointed out in many *Tortrices*—an almost total obliteration of the normal markings—while *emulana* is, as far as I have yet seen, particularly constant in both colour and markings.

The larva of *tripolianna* is plump, thickest in the middle, very slingsh, often remaining contracted into a mere lump, segments wrinkled and slightly ridged, pale pinkish-yellow or salmon colour, with the dorsal line hardly darker, under parts rather more yellow, spots invisible, and apparently destitute of hairs, head black, or sometimes chestnut-brown, dorsal plate semicircular, divided, amber-brown, darker behind, anal plate small, rhomboidal, brown, feet yellowish. In flower and seed-heads of *Aster tripolium*, feeding on the seeds, and spinning the florets and pappus together.

Received, nearly full-grown, from Mr. Machin, on October 12th, 1879. When full-fed, they left the seed-heads and spun compact cocoons on the surface of rotten wood or among rubbish, and remained (doubtless, unchanged) in them for nearly nine months, assuming the pupa state in the beginning of July, and emerging from July 24th to the middle of August. Pupa bright chestnut-brown, forced out of the cocoon on emergence.

Fembroke: 16th August, 1880.

p. 8). I then expressed an opinion that these specimens were identical with *emulana*, Schl., and this view was corroborated by Prof. Zeller; but in the meantime *emulana* had been reared by Mr. Machin from *Solidago virgaurea*, and the specimens presented constant, though slight, distinctions from the coast specimens, and my friends, the captors of the latter form, repeatedly and urgently pressed its claims to be regarded as a distinct species. Specimens were again sent to Prof. Zeller, side by side with those from *Solidago*, but he still held that they formed but one variable species, and I, therefore, urged my friends to discover and rear the larva, and thus provide positive evidence on one side or the other. This has now been done, and the larvae of the two species prove to be abundantly distinct, indeed, that of *emulana* from *Solidago* (described *ante*, vol. xvi, p. 242) is very different from all the other *Catoptria* larvae that I am acquainted with, in having *distinct longitudinal stripes*, while that of the *Aster* species closely resembles them, having *no stripes*.

The question then arises,—Which is the true *emulana*? The type which I have from Prof. Zeller does not satisfactorily solve this doubt; indeed, it does not agree perfectly with either species, and it is evident that both are confounded together on the continent, since Gartner, after giving a description which agrees very well with the larva upon *Aster tripolium*, gives both *Aster* and *Solidago* as food-plants.

Heinemann, however, describes *emulana*, Schl.: "Fore-wings brownish-grey-yellow, with numerous paler dots (flecks) on the inner margin, the basal half with white-yellow and dark brown *cross waves*, the ocellus with longitudinal black lines encompassed with shining silvery." He does not mention any food plant, but says, "in leaf-woods, rare." But this is not very material, as *Aster tripolium* is a sea-side and salt marsh plant, while *Solidago* constantly occurs in "leaf-woods" (woods of non-coniferous trees). Moreover, it is the insect reared from *Solidago* which has the "cross-waves" in the basal portion of the wing. I think, therefore, that I am right in considering the species reared from *Solidago* to be the *emulana* of Heinemann, and, probably, of Schläger also. Also, it appears to me that though this group, rich in species, is still richer in synonyms, there is not one of these that can be reliably applied to the species reared from *Aster*, and that less confusion in the future may arise from my conferring a new name on it, than misapplying an old one. I, therefore, propose to describe this species as:—

noticed *Zygena loniceræ*, not rarely, but much worn), and this time I obtained *Emmelesia alchemillata* commonly, and in lovely condition, by beating brambles, with one fine specimen of *E. blandata*. I worked hard for this latter insect at the time, as well as on a subsequent visit on July 13th, but without success: on the latter occasion I took a worn *Eupithecia expallidata*.

Returning to Galway on July 9th, I found *Argynnis Paphia* just coming out in Merlin Park, with the first lovely specimens of *Metropampa margaritata*, *Crocallis elingvaria*, *Melanthia albicollata*, *Cidaria prunata* and *immanata*, and *Pyrausta purpuralis*. *Elliptica fasciaria* was rare, and often worn, and *Phoebodes captivuncula* still lingered, though usually worn to a shadow. *Rivula servicalis* was rather troublesome some in point of numbers.

At Bantry Bay, between July 16th and 21st, although the weather was very fine, and the country looked most promising—wide stretches of rocky, heathy, hill-sides, with numerous boggy places, and some nice little woods here and there—insects, with the exception of *Eubolia palumbaria* and biting flies, did not appear to be at all numerous. I picked up one fine *Plusia festuæ* at rest on a heath-stem, and *Elliptica fasciaria*, *Larentia cæsiata* and *salicata*, *Pseudoterpna cythisaria*, *Eupithecia nana* (very dark), *Melanippe galata*, and *Crambus pinetellus* occurred, with others.

Throughout my stay in Ireland, I was unable to collect later than 9 p.m., which circumstance accounts for the comparatively very few *Noctue* in the above record.

12, Ranelagh Road, Marine Town,
Sherness: August 4th, 1880.

NOTES ON BRITISH TORTRICES.

BY C. G. BARRETT.

(Continued from page 38).

In former notes (E. M. M., vol. xvi, p. 243) I referred to larvae received from Mr. Machin feeding on *Aster triptolium*, and their probable distinctness from *Catoptria emulana*, Schl.

From these larvae the moths have now appeared. They prove to be identical with specimens formerly taken by Mr. Howard Vaughan, and since by Mr. Machin, on the Essex coast, and referred to under the heading of *modestana*, H.-S., in an earlier volume (E. M. M., vol. x,

little *Phothedes captivuncula*, flying in the hot sunshine like a *Pyrausta*, which it much resembles on the wing, being difficult to see as well as to catch. *Rhodaria sanguinalis* was much more conspicuous, and, with *Ennychia octomaculalis* and *cingulalis*, *Pyrausta ostrinalis*, *Argyrolepidia Baumanniana*, and *Pterophorus tetradactylus*, was fairly well represented in point of numbers: *Phycis subornatella* and *Pterophorus hibernici* (?) being much scarcer. *Aspilates strigularia* and *Eubolia palumbaria* occurred sparingly, and the pretty little *Cidaria fulvata*, commonly, flying over the low hazel and holly bushes, towards sunset: *Thera varvata* swarmed in a plantation of Scotch firs, the moths coming down out of the trees like a brown snowstorm. The only *Corycia temerata* which I caught was a good variety, the usual black clouding of the fore-wings being almost absent. On the railway-bank, close to Galway, *Polyommatus Alsus* was abundant, and with it *Melanippe tristata* and *Euclidia glyphica* occurred rarely.

On June 22nd, the ship went to the islands in Kilkerran Bay, about twenty-five miles west of Galway, but I could find very few insects on the barren granitic rocks of Dinish and Furnish, the only islands I was able to visit. *Hepialus vellida* flew rather freely at dusk, with a few of the *var. curvus*, and fine *H. humuli*: by nothing, I got such common things as *Noctua plecta* and *c-nigrum* (one fine specimen on the 25th), *Axylia putris*, *Caradrina Morpheus*, *Eupithecia centaurata*, *Melanthia ocellata*. *Euchelia jacobæ* was common, and *Calosetia nigromaculana* of occasional occurrence, among ragwort, and *Orthotenia antiquana* was not rare (but often worn) among *Stachys arvensis*, growing in patches of oats. The *Pterophorus* were represented by *lithodactylus* and *bipunctidactylus*.

June 30th was a fine hot day, succeeding a three days' gale from the south-west, with continuous rain. In Merlin Park, *Satyrus Hyperanthus* was out in great profusion, with a few richly marked ♂ of *S. Semele*. *Zygæna nubigena* was represented only by three or four worn stragglers, but *Phothedes captivuncula* was more common (though far from numerous) than I had previously seen it, as well as easier to secure, several being boxed while feeding on the flowers of the wild thyme. A second brood of *Ennychia octomaculalis* was out, and in a wet place close to the railway bank, I caught a specimen of *Chilomneronellus*: this spot had previously yielded *C. forficellus* and *Paraponyx stratototalis*, as well as a good supply of *Hydrocampa stagnalis*. On July 5th, the "Hawk" was again in Kilkerran Bay (the previous day, while walking near Roundstone, Co. Galway, I had

until the ship arrived at Rathmullan, on the east shore of Lough Swilly. We remained a week (May 24th to 31st) in this very promising-looking locality, but the weather was most unfavourable for collecting; wind and rain prevailing almost the whole time. By diligently searching on perpendicular rock-faces, I managed to secure a nice series of *Larentia salicata*, and with it, *Cidaria suffumata*, *Clostera reclusa*, *Odontopera bidentata*, and others. *Eupithecia pumilata* was abundant among the heather at a considerable elevation, and in very fine condition, although it was quite worn out a month previously at Queensdown: with it *Anarta myrtilli* occurred rarely, and *Coremia ferrugaria* was numerous enough to be a nuisance. In woody places *Polyommatus Argiolus*, *Iodis lactearia*, *Eupithecia plumbeolata* and *nanata*, *Cidaria russata* (all of a dark smoky form), *Platypteryx lacer-tula*, *Gymatophora duplicaris*, and others, were to be found, with *Volacristulalis*, on the tree-trunks, and one fine and remarkably dark *Hadena adusta* under a stone. On the only fine evening during my stay, *Bombix rubi* afforded excellent sport, the ♂ tearing madly about in an open heathy place near a wood, and looking almost scarlet in the rays of the setting sun; only one ♀ occurred, at rest. June 2nd saw the "Hawk" at Killibegs, Co. Donegal, where I fell in with *Polyommatus Albus*, *Thanaos Iages*, *Larentia salicata* (rare, and worn), *Eupithecia subumbra* (also near Westport, on the 5th), *Coremia unidentaria*, and others; *Emmelesia albulata* and *Botys fuscalis* occurring in great profusion in grass-fields abounding with the yellow-rattle, *Rhinanthus crista-galli*. A week of glorious weather in the middle of June enabled me to obtain a good number of insects at Galway, in Merlin Park, and the adjacent rough fields: though this district appears to have been so thoroughly worked years ago by Mr. Birchall, that it was very rarely that I obtained any species not previously recorded by him from thence. *Leucophasia sinapis* and *Melitæa Artemis* both occurred, but only single examples of each, and I was unable to find the head-quarters of either species. *Zygæna Minos*, var. *nubigena* was fairly abundant in one rough, heathy field, where *Chelonia plantaginis* flew in some small numbers in the afternoon, but was not easy to secure—to chase it over the rough, deeply fissured surface of hard limestone, among stumps and thorny bushes, being out of the question. One little sunny open spot among the bushes, abounding in wild thyme and other attractive flowers (as well as with biting flies of most ravenous appetite) was particularly productive in small moths: here, for the first time, I had the pleasure of seeing and taking the pretty

A calico sleeping bag for use in the country is a great luxury. The upper part should be made of muslin, and the bag altogether should be of a length sufficient to admit of its mouth being tied up from the interior and turned back over the face or under the head. "Notes on the Entomology of Portugal," containing no allusion to this item of economic entomology, would indeed be incomplete.

51, Park Road, Bromley, Kent :

4th August, 1880.

NOTES ON THE *LEPIDOPTERA* IN THE WEST OF IRELAND.

BY JAMES J. WALKER, R.N.

On the 24th February last, H. M. S. "Hawk," to which I was at the time attached, left Sheerness to join the squadron of small vessels engaged in distributing relief to the distressed inhabitants of the western coasts and islands of Ireland. The ship was employed on this duty until July 22nd, when she finally left Bantry Bay for England. A few notes on the *Lepidoptera* which came under my notice during that interval (for the most part on the coast between Galway Bay and Lough Swilly) may not be devoid of interest.

Although I found *Coleoptera* sufficiently well represented, both by species and individuals, at Galway, in March, I did not take a moth until April 6th, when I was rather surprised to meet with a good specimen of *Calocampa vetusta*, under a stone on the very summit of Cragh Patrick, near Westport, 2500 ft. above the sea-level. The next week I picked up single examples of *Trachea piniperda* and *Cidaria mixta*, the latter in very fine condition, at Galway, where, on April 17th, *Pieris Nap*, *Anthocharis cardamines*, and *Satyrus Argus* were already on the wing. The last-mentioned insect was common (and very fine) at Queenstown, a week later, when *Cidaria suffumata*, *Eupithecia punilata*, and (I think) *trisyriata*, also put in an appearance.

At Galway, *Polyommatus Argiolus* was not rare in Merlin Park, some three miles from the town, during the first week in May, with *Phanaos Iages*, *Nola cristulalis*, *Thera varvata* (not rare), *Eridonia atomaria*, *Venilia maculata*, *Eumychia octomaculalis*, and others, on the wing at the same time.

Leaving Galway on May 10th for a cruise to the northward, I had very few opportunities of collecting insects (except on the glorious sea-cliffs of Slieve League, Co. Donegal, near the summit of which I found *Saturnia carpi*, *Eridonia atomaria*, *Eupithecia nanata*, &c.).

and guess. Excepting from Sao Bartholomew do Messines to Silves, and from Silves to Monchique, the roads were mere mule-tracks, and sometimes no better than cattle or sheep paths. The country is so thinly peopled, that whenever the track happened to divide, much judgment had to be exercised in deciding which was the right branch to follow. Monchique is usually reached either by carriage from Portimao, or by mule from Casével or Castro Verde *vid* Ourique. From Lisbon, Portimao is accessible by occasional coasting vessels, or a steamer which sails for Faro every three weeks might be resorted to, Cea (June 4—11), near the Estrella, is reached by diligencia from Coimbra. The inn being full, accommodation was extemporized upon the floor of the common eating room. The slopes of the mountains are in parts extensively cultivated and subjected to irrigation. Beyond the limits of cereals, potatoes are grown, up to at least 4400 feet; above this, cistus at first, and then heath is the prevailing vegetation. The neighbourhood is favourable for *Trichoptera*, but was only partially explored. It was here, at an elevation of about 1800 feet, that the larger forms of *Rhyacophila* were first met with in going northwards. Caddis worms occurred in profusion in a lake at an altitude of about 5122 feet, in company with pupæ of *Libellula* and troops of frogs; nymphs of *Siphonurus* were there also; but the season for alpine *Trichoptera* had not arrived. *Macro-Lepidoptera* were not particularly plentiful. Ponte de Morellos (June 12—14), the half-way house between Cea and Coimbra, yielded some interesting species indigenous to the warmer parts of Beira Baixa.

Villa Real (June 22—25) is reached from Porto by rail to Pezo da Regoa, and thence by diligencia. From the first and the last mentioned towns, access can be gained by diligencia to various parts of the provinces. Braga is another focus of such routes, and from thence Salamonde and Ruivaes (June 29—30), near the Gerez, were visited. Of these districts, the neighbourhood of Villa Real seems to be the best for *Trichoptera*, while the vicinage of Salamonde is perhaps more favourable for *Macro-Lepidoptera*. Heath is the prevailing growth on the hills in both districts.

Murray's Handbook (1875) is about as good a guide book for English people as any of Portugal; only it needs thorough revision. New roads of good construction, and new railways, have been and are being made in many districts, and have modified the itinerary considerably; hence, the distances by road in Murray are often greatly underrated, and some of the diligencia routes are disused. The heights of the mountains, on the other hand, are sometimes exaggerated enormously.

and then, as though a favour had been conferred upon him, walks upwards of a mile over and down a hill to point out the track which must be followed. On nearing Sao Bartholomeu do Messines the flora begins to wear a more varied aspect: in places arbutus, myrtle, and jasmine border the tortoise-haunted streams in lieu of oleander merely; and the change becomes more marked when Silves is approached, carobs and the increased luxuriance of orange, fig, and olive betokening the greater warmth and fertility of the lowlands. The call of the hoopoe and of other birds common in Alentejo still resounds through the trees, but *Cyanopica* is a new feature in the scenery. Good sites for collecting *Lepidoptera* exist among the olive grounds and oak scrub on the hills, resorts of *Bombus* and *Ascalaphus*; streamlets fringed with *Tamarix* swarmed with *Hydrotillidæ* late in the day; but the river at Silves yielded nothing apparently but species of *Culex*. A species of *Diptera* attacks oranges; its maggots occur occasionally in the fruit at Silves, several in the same gore, and their presence is in most instances (if not always) betokened by a soft discoloured patch in the rind. Possibly this may be well known. At Monchique another change of flora is experienced, a modification of that which predominates in the cistus tracts. Near the town the sides of the hills are planted with cork woods, and with chestnut grown for rafters; lower down, and almost among the houses, oranges, maize plots, vineyards, &c., occupy the slopes; while cereals and potatoes are planted in the uplands. Amidst the well-watered herbage many English species of plants are conspicuous, associated with peonies and rhododendrons. *Lepidoptera* were scarce, *Thais* sauntering amongst the groves, *V. caroli* in more open spaces, *V. Atlantica* high up on the hills, besides other forms. The sources of the streams at high elevations presented various peculiarities, issuing sometimes from the midst of dense thickets of rhododendrons and heath, sometimes from narrow water-cut trenches several feet in depth. Interesting forms of *Perilæ* and *Trichoptera* can frequently be obtained at these sites by beating the heath and fern (especially *A. filix-femina*) into the net. During this excursion the distances to be traversed in a day, combined with the difficulties attendant upon the nature of the routes, precluded much collecting being done by the way.

The Portuguese government-map, edited by Cons. F. Folque (1860—5) was found insufficient for detail, but trustworthy for general bearings of localities. Consequently, in walking to Monchique and back, the route had to be ascertained for the most part by compass

pericene in collecting them. *Lepidoptera* are rather local; in some places, amongst the cistus especially, where a thin herbaceous growth occupies the intervals between the bushes, Micros are plentiful; and in showery weather they are easily captured while flying for shelter towards the cork trees. In fallow and cultivated parts, to which Macros are more partial, *Euchelia jacobæ* is found sometimes. Hy-menoptera were well represented.

A fortnight's tramp was made from Almodovar (May 12) over the Serra de Caldeirao by Sao Bartholomew do Messines (May 13) to Silves (May 14—17); thence (May 18) to Monchique (May 19—21), returning (May 22) by Alferce and Sao Marcos da Serra (where May 23 was spent), and (May 24) through Santa Clara a Nova to Almodovar. The neighbourhood of the Serra is thinly peopled, and at nightfall walking by moonlight towards the end of the first day's march, greater ease was experienced in falling over rocks in the opposite track, than in finding a place to rest in. A dog barking on the opposite side of a deep valley eventually led to the discovery of a few cottages, each consisting of one room on the ground floor and a stable. An open door discloses supper in course of preparation over a fire of cistus wood, whose mild and somewhat fragrant smoke fills the room and oozes slowly through the red-tiled roof. After knocking at the door, an advance, accompanied with apology in dumb show for the untimely intrusion, is made towards the hearth, by whose light the phrase book is desperately ransacked for words appropriate to the occasion. At last the right place is hit upon, and "Pode Vósmece alojar-me?" is launched forth as an experiment, with significant pantomime. A reply is given: but what is the reply? That is another question altogether, about which the phrase book is silent; but events throw some light upon its nature. The hospitable peasants order their grown-up daughter to sleep in the cow house, and improvise a fourth bed upon the earthen floor of the family apartment for their unbidden guest. Supper ended, all stand up to worship in silence. Then the dictionary is admired and employed as a medium for mutual information during the smoking of "cheroots" (*anglice*, cigars of ordinary make), which *they* take to have been smuggled, and deem too precious to be consumed in one piece. When all have risen in the morning, the scene is enlivened by little pigs crowding in to be fed upon lupin-pods, and by hens and chickens in quest of maize, the pet of the family in her nightdress slapping the former when they seem too greedy. The father is with difficulty prevailed upon to accept the most ordinary remuneration, tendered as "something for the children."

see after the train; resort is had hastily to the dictionary for words to address him with; it is then ascertained that there is no means of going further on that evening, that the shed (all ground floor) is an inn, and that one of the railway officials can speak French. This last one is installed as interpreter forthwith by general consent. The whole population derive an evening's entertainment from microscopical exhibition of certain entomological specimens fresh from the bedroom, and arrangements are made for the next morning by the interpreter. At half-past six, a man, with a mule dragging the skeleton of a cart, is at the door. The vehicle, devoid of springs, is lined with a sheet of rush matting, slung from pegs along the top rails, and is going to Aldea de Neves. This was a favourable type of the conveyances in Portugal; its wheels did not groan nor shriek, and it was drawn by a mule instead of by oxen. The mule too knew the road, and that was an advantage of which the driver was not slow to avail himself, letting the animal proceed by itself a mile ahead while he stopped to make love to his *fiancée* in a garden. The pace was slow enough to admit of stone-turning being carried on amongst the cistus bushes, leading to the capture of some *Coloptera* and scorpions. The latter are easily caught by the tail with a pair of forceps and dropped into the killing bottle; they cannot curve themselves sufficiently to lay hold of the forceps with their claws.

At Aldea de Neves a change was effected in the mode of transport. A man with a horse was procured; part of the baggage was adjusted like a knapsack upon the rider's shoulders, and the rest had to be embraced with his arms, and balanced as well as it could be upon the neck of the bare-backed steed. A brigand-pattern blanket was then thrown over the whole, and the horse led slowly along by the halter. Almodovar was five or six miles off; and the horse was a strongly carinated animal of corpulent tendencies.

The country surrounding Almodovar for some distance is uneven, but the hills are of inconsiderable elevation above the average level of the vicinage. The streams, like most others in Portugal, are subject to excessive floods during the winter rains. Wherever this is the case, if the stream-bed is of shifting material, the shallows are rendered almost uninhabitable, and the *Aneuroptera*, contrary to their usual habits, betake themselves chiefly to the deeper pools. The warmth of the water often induces snakes to take up their quarters for the night beneath immersed stones, where they are likely to be found, entangled in folds, by the collector in searching for larvae. Shelter suitable for *Trichoptera* being scarce in this district, a difficulty is often ex-

At low altitudes *Macro-Leptidoptera* were rarely visible, and they only species of *Pieris* or *V. cardui*; but at Cintra they were more numerous; between Lisbon and Setubal, that is, beyond the Tagus, better collecting ground exists. The best localities for *Trichoptera* occur in the vicinity of Cintra; the streams nearer Lisbon have all the goodness washed out of them by laundresses. *Hemiptera* and *Coleoptera* were to a large extent disregarded; *Luciola* had begun to appear, but was not plentiful. No *Orthoptera* were collected, because C. von Volxem and other entomologists had already sufficiently attended to them. In Lisbon and Oporto male field crickets are sold in miniature cages by bird fanciers at the rate of a penny a-piece. They are kept in stock by hundreds together in open tea chests, lined for the first three or four inches from the top with strips of tin, and are fed upon lettuces. The natives like to have a "grillo" chirping in the room, and make pets of them. *Mantis* eggs abound under stones on the hills west of Lisbon, as well as in many more southerly parts of Portugal.

Neuroptera (including the ill-termed *Pseudo-Neuroptera*, which Mr. G. R. Crotch always maintained should surely be regarded as the normal type of the Order) were in species comparatively few in number. *Ephemeridae* are represented almost exclusively by forms allied to *Leptophlebia* and *Olocon*.

Almodovar (May 6—12) was chosen as the centre whence southern Portugal and the kingdom of Algarve could be worked. Judging from the map, it seemed easy of access from Lisbon by rail and diligencia (one train each way per diem), and it was natural to suppose that the present terminus of the line (Casevel) would be the station to alight at in going there. This was, however, a mistake; Carregueiro, the last station but one (not indicated in the map, nor mentioned at all in Murray's handbook), is the place whence the Almodovar diligencia starts. The line passes through a somewhat monotonous tract of country, comprising tertiary, palaeozoic, and eruptive rocks. The prevailing vegetation is, in some parts, cistus, which, in others, shares the soil with *Lavandula*, dwarf oak, or heath. *Gentista* also contributes largely to the brushwood in places. In less sterile regions, pine trees, cork and olive trees form features of the landscape, or else extensive corn lands. Large birds of prey are plentiful. Descending with one's baggage at Casevel, two buildings were visible—the station and a shed, and being left in sole possession of the platform, opportunity was given for considering at leisure "What is going to happen next?" Presently some one, possibly the engine driver, is heard returning to

NOTES ON THE ENTOMOLOGY OF PORTUGAL.
I. INTRODUCTION.

BY THE REV. A. E. EATON, M.A.

A small collection of Portuguese land-*Arviculata* lately brought to England, illustrates, though imperfectly, the entomological condition of portions of that kingdom and of Algarve during the period intervening between the end of April and the end of June. The interest attaching to even fragmentary information, concerning a fauna still imperfectly explored, may be held to justify the publication of a series of Notes relating to them. An account of the character of the districts in which the captures were made, seasoned with occasional incidents of travel, will serve as an introduction to the series.

In visiting a country of whose language one is completely ignorant, relying entirely upon phrase-book and dictionary in communicating with the inhabitants, some amount of inconvenience is apt to be experienced at first. If a dog take a sudden fancy to your legs, you cannot go fumbling about in the books to find out what ought to be said to it in the absence of stones; besides, it might mistake a mispronounced ejaculation for a challenge to come on. Then, again, there are Custom House officers and boatmen to be replied to. An hotel, where it is possible to be understood, seems the natural place to turn to for a respite from perplexity. Making it head quarters, sallies can be made at leisure upon the shops with the object of acquiring skill in gesticulation, when the point of quotations, rendered with conjectural pronunciation from the dictionary, fails to be appreciated. In the intervals of these feats of oratory, the neighbourhood can be explored, until at length, hardened by practice or emboldened by slight success, the desperate resolve is taken to change the base of operations and plunge into the country.

In the present instance, Lisbon and Cintra were the harbours of refuge (April 23—30). North of the Tagus, within a few miles of the city, things were already wearing, in some particulars, the aspect that in England would be attained by them in early June: *Robinia pseudacacia* in gardens; and, in cultivated lands, *Adonis*, *Papaver*, *Fumaria*, *Anthemis*, *Chrysanthemum*, *Convolvulus*, *Glaucolus*, besides a host of other plants, were in full flower. Aculeate *Hymenoptera* were well represented by *Andrena* and many species of *Formicidae*; *Anthophora* occurred occasionally along the roads; *Bombus* was noticed only on the Cintra hills, and was scarce. Near Olivares some *Micro-Lepidoptera* were obtained, by beating, in a hollow lane and beside the railway, which is used as a footpath to Sacavem.

33. *Pheidole pusilla*, Heer.

(Nos. 44, 45, 46, & 48).—One of the commonest ants in Oahu, and probably elsewhere (T. B.). The house-ant of Madeira; and occasionally met with in England (W. F. K.).

34. *Solenopsis geminata*, Fabr.

(Nos. 47 & 53).—Common near Honolulu; also met with in Oahu (T. B.).

35. *Evania lævigata*, Latr.

(No. 17).—Generally common in Honolulu (T. B.). Common throughout the warmer parts of the world (W. F. K.).

The collection also contained about a dozen specimens of *Chalcididæ*, &c., which stand over for future examination. Mr. Blackburn informs me, in answer to an enquiry, that he has not yet met with any *Tenthredinidæ* (W. F. K.).

July, 1880.

Note on Eupteryx stachydearum, Hardy.—On the 25th inst. I found this species abundant on tansy (*Tanacetum vulgare*) in the garden, both sexes in different stages of maturity, and there was therefore no doubt that they had fed on this plant. This is worth recording, because the species has hitherto been noted as having been found on plants of the Order *Lamiaceæ*, of which none were near the place; whereas the tansy belongs to the *Compositæ*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: July 30th, 1880.

Two new European Homoptera.—[In the "Entomologische Nachrichten" of 1st March last, are the following descriptions of two very interesting species, which I transcribe for the benefit of those who may be inclined to look for the insects in Britain, where there is surely good reason to believe they may be found; the *Aleurodes*, especially, in the north.—J. W. D.]

ALEURODES VACCINII, Künow. Antennæ, legs, and abdomen yellow. Head, pronotum, and thorax brownish, each segment of the abdomen also with a transverse brownish band; but in newly developed examples the entire body is unicolorous yellow.

Antennæ short, the second joint the longest, as long as the four following together. Eyes large, only one on each side (*A. proleptella* has two on each side), constricted in the middle. Wings pure white, apex broadly rounded, the broadest part shortly before the end, and all with one nerve, which reaches almost to the end. In the upper wings the nerve arises near the outer margin, and beyond the middle of the wing up to the end lies at a very obtuse angle; in the under-wings the nerve goes in an almost straight line through the middle. In the ♂ the wings are narrower, and the abdomen, which is forcipate at the end, is more slender.

Length, ♂, 1 mill., ♀, 1¼ mm.

Pupa oval, very flat, 1—1¼ mm. long, $\frac{3}{4}$ mm. broad, yellowish, with some brownish dots and marks. Thorax and abdomen sharply raised on the upper side, the latter, on the middle line and on the sides, having small prominences, the rest of the broad and flat margin crenate.

This species lives on *Vaccinium uliginosum*, and has hitherto been found by me only on one spot in the "Caporner Haide," near Königsberg. The pupæ, attached to the under-side of the leaves, fall with them to the earth and hibernate; the perfect insects are developed at the middle of June in the following year.

COCCUS COMARI, KÜNOW. ♀, oval, a little longer than broad, beneath flat, above hemispherical; colour clear brown; the insect surrounded by a singular wreath-like white secretion.

Head free, projecting downwards. Antennæ and legs very short. Antennæ 9-jointed, the end joint the longest, the first two thicker than the rest, but of equal length with the third. The segments of the body, both on the upper and under-side, are perceptibly separable; the apex with two small points.

Length, 2½—3 mm.; ♂ unknown.

This species, which is found on *Comarum palustre*, sucking near the root, is distinguished in many respects from other species of the genus, so much so that a new genus might be founded on it. All the species of *Coccus* known to me move about up to the time of their maturity, then fasten themselves, and, as they are slowly perfected, lay their eggs in a white enveloping secretion. *C. comari*, on the contrary, sucks itself (saugt sich) fast precociously (probably, soon after coition), and never after leaves the place. (Hence the retardation of development in the legs.) The young ones are developed in the body of the still-living mother, and remove thence at the end of June. Locality, Dammhof, near Königsberg.—KÜNOW, Königsberg.

*On the mode of respiration in the larvæ of the genus Euphæa (Calopterygina).—*On each side of segments 1—8 of the abdomen is a conical branchial appendage with unravelled edges; three strong, equal, cylindrical caudal branchial appendages; the rectal branchiæ formed of three simple columns.

The existence of lateral branchial abdominal appendages is known in the genus *Sialis*, but is altogether unique in the *Odonata*. Respiration in the larva of *Euphæa* is thus possible in four different manners. (1) by stigmata, two on the thorax and eight on the abdomen; (2) by lateral branchial appendages well provided with tracheæ; (3) by caudal branchial appendages equally well provided with tracheæ; (4) by rectal branchiæ formed of three columns in the mucous system of the rectum, well provided with tracheæ. No doubt the four kinds of respiration do not act simultaneously, and the stigmata of the abdomen probably never, as they only receive a simple tracheal branch, but the stigmata of the prothorax are provided internally with numerous well-developed tracheæ, and perhaps serve for the expulsion of used air.—H. A. HAGEN (translated and abridged from the Comptes Rendus of the Belgian Entomological Society, Meeting of the 1st May, 1880).

[This is a most important physiological discovery, and shows how little is yet known of the structure of the larvæ of Dragon-flies. The beautiful genus *Euphæa* inhabits tropical Asia and the islands of the Eastern Archipelago.—R. McL.]

Æcetis notata in Yorkshire.—You will be interested to hear that *Æcetis notata* is common by the River Wharfe, at Tadcaster, Yorkshire. It is associated with *Æ. testacea*, which is also abundant.—FRANCIS G. BINNIE, 439, St. Vincent Street, Glasgow: 28th June, 1880.

[*Æ. notata*, a pretty long-horned Trichopterous insect, was known as British only by the example taken by me at Weybridge in 1873, recorded in Vol. xiv, p. 18, of this Magazine.—R. McL.]

[P.S.—On the 17th inst. I found another example near Weybridge, on the north bank of the Thames, nearly opposite the mouth of the Wey.—R. McL.: 28th July, 1880.]

Marsh Lepidoptera in Pembrokeshire.—In this moist climate (of Pembrokeshire) it would seem reasonable to expect that, along with marsh plants, marsh insects would be widely distributed over the country, and this certainly *is* the case with some few species, but there are degrees of dampness even here, and I have lately been much interested in working a piece of peculiarly wet marsh, thickly overgrown with *Iris pseudacorus* (locally called "Liverocks"), *Senecio aquaticus*, *Myosotis palustris*, *Ranunculus flammula*, *Sparganium*, *Mentha*, *Epilobium*, &c. Here I found what I have looked for in vain for many years—*Bactra furfurana*—in plenty and with considerable variation in markings, flying late in the afternoon and until dusk among the lowest herbage, and notably among a small slender species of rush which must surely be its food-plant. Here also was *Platyptilia isodactylus*, not so plentiful but by no means scarce, flying before dusk among *Senecio aquaticus*, in the stem of which its larva feeds, and among which it conceals itself in the day time, and here too are occasionally to be found the very pretty little *Opostega crepusculella*, with *Laverna propinquella* and *lacteella*, which, with a dubious *Coleophora*, complete as far as I know the list of interesting Micros, but *Phibalopteryx lignata* occasionally flits by, and the flowers attract *Plusia festuæ* and other Noctuæ. On one particularly favourable evening I met with three *Camptogramma fluviata* flying over the flags. All were worn and all males, but the hint may lead to future more satisfactory results.—CHARLES G. BARRETT, Pembroke: 13th July, 1880.

[P.S.—*Platyptilia isodactylus* is again out, but smaller of course, from its rapid feeding up in hot weather. If it were desirable, or I could spare the time, it would be easy to take hundreds. Along with it is *Scopula ferrugalis* in plenty.—C. G. B.: 17th August, 1880.]

Food of Scopula lutealis.—I have recently been breeding this species, from larvæ collected here at the end of May, very freely from the lower leaves of bramble bushes, and also from wild strawberry, *Plantago lanceolata*, *Ranunculus*, and several other low plants. The larva described in this Magazine some time ago was found on dock; and Dr. F. B. White found it on thistle, so it is evidently quite as general a feeder as are *prunalis* and *olivalis*.—GEO. T. PORRITT, Highroyd House, Huddersfield: August 5th, 1880.

Natural History of Crambus culmellus.—Although this is a very common

species, yet its history has, I believe, never been investigated, or any description of the larva published, a desideratum I have herein attempted to supply from the opportunity afforded me by Mr. J. Gardner, of Hartlepool, who kindly sent me first a larva, in 1878, and in 1879 a batch of eggs on 22nd of August; these began to hatch on the 28th, when the larvæ were transferred to a large pot planted with *Festuca duriuscula*, and having a margin of moss inside.

On the 4th of October I observed several of their little tubular galleries, open at top, as they were spun in an upright position amongst the grass, with a few withered grass particles adhering; and by the 16th, many more could be seen, more or less connected with each other and the grass by a number of fine silk threads.

The grass was vigorous enough to withstand their early attacks, and flourished well during the ensuing winter while the larvæ were quiescent, until a warm and sunny day (the 6th of March, 1880) waked them from their torpor, when they became very busy amongst both grass and moss, in extending the old residences and constructing others, uniting the moss-covered galleries to the grass blades near, with a great number of fine threads, and in the same way they secured the moss to the side of the pot.

By degrees, the combined attack began to check the growth of the grass, which presented a melancholy spectacle as June approached, when a fresh pot was provided, barely in time, as I found the greater number of larvæ had escaped, though a couple had been picked up while deserting their old quarters, just in time to warn me of their exodus; but enough for my purpose were put in the fresh grass to produce six examples of the moth, which appeared from 19th of July to August 1st.

The egg in shape is elliptical, having an elongate depression on part of its surface, and is very closely ribbed and finely reticulated; when first laid it is of a whitish straw tint, changing in two days to flesh colour, again onwards to salmon colour, and then to deep pink, when it begins to hatch. The young larva at first is of a pinkish-salmon colour with darkish brown glossy head and plate, the body without gloss, and a pale brown anal plate. By the middle of October the larva is just a little over one-eighth of an inch long and proportionally stout, its form cylindrical and slightly tapered only at the hinder segment, having all the segmental divisions well cut, the head is of an opalescent or whitish flesh colour with conspicuous black ocelli, the second segment is of similar pale colour but having an internal leaden-grey blotch showing through the surface, the rest of the body pinkish-brown, with the anal flap pale as the head, the horny tubercular spots close together and concolorous: its gallery or tube a quarter of an inch long, composed of silk, covered with frass having the appearance of finely gnawed grass.

After hibernation the new gallery is formed between a few blades of grass, about the distance of an inch and a half above the ground, and is covered with fine particles of moss and of withered remnants of grass blades, or with frass only; early in March its occupant is more than three-sixteenths of an inch long, of an uniform brown colour, the spots only noticeable by their gloss.

Towards the end of April the larva has grown to the length of three-eighths of an inch, moderately stout in proportion, though gently tapering from the thoracic segments to the thirteenth, its colour much paler, without any difference in that of the head, plates, spots, or the skin of the body, except that the latter is dull and all the former shining.

During June the larva attains full growth of half an inch in length, or a trifle more, the skin of the body is still a light flesh colour, but the head, plates, and spots show more distinctly from it of a light warm cinnamon glossy brown, the spots not quite so large in proportion as with many of the genus, the parts of the mouth are outlined with darker brown, and each lobe on the crown of the head is margined by a short blackish-brown streak, and has besides a few other spots and streaks above; the plate on the second segment bears a few minute black-brown dots and a larger pair on the hind margin; each tubercular spot bears two dots of darkish brown, one small, the other larger, furnished with a fine hair, the minute spiracles are round and black. It travels forwards or backwards equally well, and from the middle of June converts its tubular residence into a cocoon of oval shape from three-eighths to half an inch longest diameter, smoothly lined with pale grey silk and externally covered with frass or particles of moss, or with both.

The pupa is three-eighths of an inch long, of the usual contour but rather plump, the head and thorax moderately produced, the form tapering very slightly towards the widest part of the body at the ends of the long wing-covers, from thence the abdomen tapers a little more towards the rounded-off tip ending with a rather prominent boss; in colour it is a light warm shining brown, the lower part of the wing-covers paler brownish-yellow, the terminal boss dark brown.—WILLIAM BUCKLER, Emsworth: *August 12th*, 1880.

Batrachedra præangusta.—In my letter to Mr. Stainton which he has published in the Magazine for this month, I stated that having found a larva in the lining of a gold-finch's nest, it was not until I saw what the nest was lined with that I recognised the species to which that larva belonged. Mr. Stainton seems to me to go somewhat out of his way in suggesting that the reverse of this mental process was what actually occurred. He writes, "No doubt the larva itself helped to explain to Lord Walsingham of what materials the lining of the nest was really composed, for the larva of *Batrachedra præangusta* is so remarkably conspicuous that any one who has once seen it can hardly fail to recognise it wherever "met with."

Had this been the case I should not have expressed myself in exactly the opposite sense.

I gave to Mr. Stainton two or three years ago the only two preserved specimens of this larva which were in my collection, together with the information which seemed to be of some interest to him, that they were found living in the down of sallow catkins.

The curious position in which this larva has now been found, although confirming my previous observation as to its habits, affords perhaps a sufficient excuse for my having failed to recognise it, until by chance I saw that the gold-finch's nest was not lined with the usual thistle-down, but with that of sallow catkins.—WALSINGHAM, Eaton House: *July 16th*, 1880.

Capture of Dyschirius angustatus, Ahr., at Hayling Island.—I was at Hayling Island for two days about the end of last June, and captured about half-a-dozen of the above-named species on the Sandhills, to the West of South Hayling. I did not

recognise the species when I caught it, or I might doubtless have secured more. I cannot find it recorded from this locality before, although I hear that Mr. Moncreaff has also taken it.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: *August 11th*, 1880.

On the phosphorescence of the Glow-worm.—In reading Dr. Sharp's note on the European Firefly in the August number, p. 69, on the interruption of light, as described by MM. Perroud and Arias, in the above species, it occurred to me that I have observed a similar interruption in the light of our common Glow-worm. I had a fine female sent me for identification some time ago, and I turned her out on my grass plot, she concealed herself during the day and at night came out and exhibited her light; I have stood over her with a lamp to see if the strong light which it gave would have any effect upon her, but so far as I could see it had none. While watching her I observed that she was turned half round, that is, the posterior segments were turned half round so as to bring the inferior surface uppermost, and thus exhibit the light, or rather lights, for the phosphoric light emanates from two of the abdominal rings leaving a distinct line between the two light-giving spots.

The insect will remain in the position above described for two or three or more minutes, and then turn herself, or rather the abdominal half, round on the other side so as to throw the light in another direction. When she has remained in this position without attracting a mate she will again reverse the light, and try again in another direction, by this means the observer sees an intermittent light; I watched this insect for several nights and observed that she proceeded in the same manner on each night. This will account for the disappearance of the light at certain times, and its re-appearance.—EDWARD PARFITT, Exeter: *July 31st*, 1880.

Notes on the intermittent light of Luciola lusitanica.—In returning by the high road from Sacavem to Lisbon in the evening of April 24th, the sight of a few fireflies upon the wing recalled to mind a discussion at the Meeting of the London Entomological Society in February last, concerning the manner of their giving light. I therefore stopped to ascertain by careful observation some particulars about it, which were noted down the same night. It will be seen that they do not entirely agree with M. Mulsant's statement of the means by which the light is extinguished, to which Dr. Sharp has alluded in the present volume of the E. M. M., at p. 69. My notes do not record the colour of the light, but, judging from recollection, I believe that when viewed at a moderate distance it is very spark-like in appearance; whereas, if examined with a lens, the effulgence may be likened to that of the moon seen through a telescope.

The duration of each gleam of the light is from about $\frac{1}{4}$ to about $\frac{1}{3}$ of a second; and usually there are on an average 36 emissions a minute. The light throbs in the luminous patches simultaneously, and is extinguished as a rule completely during the intervals of the flashes; but under certain circumstances it can be reduced to an almost imperceptible phosphorescence without being quite put out. The hinder patch can be darkened independently of the other, from which it is separated by a transverse non-luminous band, and is slightly emarginate in the middle behind. In sites exposed to the breeze the insects remain settled in places where shelter is afforded them (*e. g.*, in the lee of stones in the roadside heaps, or at the entrance of

chinks in "dry walls"), while within a stone's throw of the same localities their neighbours in nooks protected from the wind are flying freely. The flashes of light are maintained at the ordinary rate of intermission after the insect has alighted, and when it is caught in a hat; but if it is held between the finger and thumb their frequency is greatly increased. Within the cyanide bottle the beetle at first continues to flash; but within a few seconds after being placed there, the light gleams steadily without interruption, gradually dying away *pari passu* with the insect.

At the end of April fire-flies were only just beginning to appear at Cintra, and therefore were few in number. At no time did I see them anywhere in throngs; consequently my notes exclusively refer to the behaviour of individual specimens in solitude.—A. E. EATON, 51, Park Road, Bromley, Kent: *August 7th*, 1880.

Review.

ILLUSTRATIONS OF TYPICAL SPECIMENS OF LEPIDOPTERA HETEROCERA IN THE COLLECTION OF THE BRITISH MUSEUM. Part IV. *North American Tortricidæ*. By LORD WALSHINGHAM. London: printed by order of the Trustees, 1879. 4to, pp. 84, and 17 Plates.

This work is without doubt one of the most valuable contributions to our knowledge of the North American *Tortricidæ* that has hitherto appeared. His lordship has not only described a large number of new species from our Pacific Coast, but has also re-described the North American species of the *Tortricidæ* published by Francis Walker, giving colored figures of all.

Of the work of Mr. Walker I have no need to speak, since his entomological writings have been most fully discussed, not only by American and German but also by English entomologists themselves. Many Micro-Lepidopterists have quite disregarded his species because his descriptions are so very faulty, but Lord Walsingham comes in with this most timely contribution and makes us acquainted with Walker's species of the *Tortricidæ* from North America, and it is sincerely hoped that he will continue the work so well and auspiciously commenced, until he has re-published all of Walker's species of the *Micro-Lepidoptera* from whatever country.

To one who has examined Walker's types, it will be a matter of surprise that so great a degree of accuracy has been obtained, for many of the typical specimens in the British Museum, described by Walker, are so badly denuded that they ought never to have been described at all. The imperfection and unnaturalness of some of the illustrations are doubtless to be accounted for in this way.

The system of classification laid down by Heinemann has been adopted with some modifications; but with all the imperfections of that system, it is, without doubt, in the direction of a more complete and natural classification for the *Tortricidæ* than has been presented by others.

There can be no doubt that a step has been taken in the right direction, in raising the sub-genera of Heinemann to generic position, which has already been done in part by Wocke and others.

On the orthography of certain names there will, no doubt, be a difference of opinion. Many agree with Prof. Zeller in changing the spelling of a word from that given by the original author to one more consistent with the derivation, and Lord Walsingham, in a letter just received by me, says, "I shall be grateful to you

in any review of my work to correct *Cochylis* to *Conchylis* with my entire concurrence." I have read with care all that has come under my notice published on this question of orthography, and I can reach no other conclusion than that it is better to make such corrections as the above, and for the same reason *Lozotania*, Steph., becomes *Loxotania*, Steph.

For the Californian species *cuneanum*, the genus *Hendecastema* is established, but this species is identical in structure with *humerosana* which Clemens published in 1860, and for which he established the genus *Amorbia* which must take precedence over *Hendecastema*. I am very sure his lordship did not possess an example of *humerosana* at the time he published this work, else he would have noticed their generic relation and placed his *cuneanum* in the genus *Amorbia* of Clemens.

I cannot convince myself that *lutosana*, Clem., is identical with *incertana*, Clem., or with the European *politana*, which is not uncommon in this country. Specimens identified by Prof. Zeller as *politana*, Haw., have been raised here from *Pinus strobus*. I think the identity of these species is still an open question.

The species *pulcherrimana*, Wlsm., and *demissana*, Wlsm., belong to the genus *Dichelia*, while *xanthoides*, Wlk. belongs to *Eneetra*.

Conchylis gratana, Wlk., is regarded as equivalent to "*Croesia? reticulatana*, Clem., var. *sulfureana*," but *reticulatana*, Clem., is a true *Cenopsis*, while *sulfureana*, Clem., is quite distinct, belonging to the genus *Dichelia*. According to my notes on Walker's types *gratana*, Wlk., is identical with *sulfureana*, Clem.

Sericoris fœdana, Clem., is given as a synonym of *Penthina hebesana*, Wlk. I must hold myself responsible for this error, for I am very sure I told his lordship that such was the case, and I had very good reason at the time for thinking so, but I now have the type of *fœdana* before me, and it proves to be distinct from *hebesana*, Wlk., but identical with *Sericoris concinnana*, Clem., and is a true *Exartema* and must be known hereafter as *Exartema concinnum*, Clem.

Exartema griseoalbanum, Wlsm., is a true *Penthina*, as shown by the males in my collection. The type was a female, hence it was not possible to be sure of its location.

The British Museum Authorities are to be congratulated upon the publication of a work so reliable and valuable to workers on this family of insects.—C. H. FERNALD, State College, Orono, Maine, U.S.A.

ENTOMOLOGICAL SOCIETY OF LONDON.—August 4th, 1880. J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Sir Sidney Saunders forwarded for exhibition four living specimens of *Prosopis rubicola*, all stylized females, recently bred from larvæ extracted from briars received from Epirus, and contributed notes thereon.

Miss E. A. Ormerod exhibited a soft gall-like formation found on *Rhododendron ferrugineum*, but believed to be of fungoid growth.

Mr. Billups exhibited a specimen of *Heptaulacus villosus* from Box Hill.

Mr. H. J. Elwes communicated a paper "On the genus *Colias*."

Mr. W. L. Distant read a paper entitled "Notes on exotic Rhynchota, with descriptions of new Species."

DESCRIPTIONS OF FIVE SPECIES OF ACULEATE HYMENOPTERA
UNRECORDED AS BRITISH.

BY EDWARD SAUNDERS, F.L.S.

In the August number of this magazine I mentioned that I had captured at Chobham three species of *Pompilidæ* new to our list, and I deferred describing them fully until I could have an opportunity of examining them more carefully. I now offer the descriptions of these, and also that of a fourth species, of which I took a ♂, two years ago, at Chobham, and two ♀ this year.

During my stay at Chobham, I also caught two ♂ of a species of *Andrena*,* which I did not recognise, flying about the heather: these prove to be ♂ of *lucens*, Imhoff, a very distinct species, and also an addition to our fauna. I find in my collection another specimen of the same species, without note of locality, given to me by the Rev. H. S. Gorham. A description of this species follows those of the *Pompilidæ*.

1. *Pompilus minutulus*, Dahlbm., Dispos., 1842, p. 10.

= *neglectus*, Dahlbm.?

= *cellularis*, Thoms.

Black, the two basal segments of the abdomen, and the base of the 3rd red; the apex of the 2nd segment in the ♂ sometimes more or less fuscous.

Face, below the antennæ, sides of the thorax, the metathorax, and coxæ, covered with silvery pubescence; prothorax sharply emarginate posteriorly, wings with a broad, fuscous, apical band; 3rd submarginal cell triangular. ♂ with the posterior tibiæ sinuate on the side towards the body, and incrassated at the apex. ♀ with the anterior tarsi simply spinose, not pectinated as in most of the species. Length, 8—9 mill.



Posterior
tibia of
*P. minu-
tulus* ♂.

This species exactly resembles *gibbus* in general appearance, but the shape of the posterior tibiæ of the ♂ and of the anterior tarsi of the ♀ readily distinguish it.

Thomson calls this species *cellularis*, Dahlb., and refers Dahlbom's *neglectus* to *spissus*; he may be right as to *neglectus*, of which Dahlbom says, "cellula cubitalis 3ia late trapezina," a character belonging to *spissus*, and not to this species, but I cannot think that he is right in referring our species to *cellularis*, Dahlb., of which the author says: "cellula cubitalis 3ia minuta triangularis petiolata, corpus parvum ♂ valvula analis et segmenta ventralia ut in ♂ pectinipede, at valvula major et apice barbatula."

Wesmael, who, like Thomson, describes the present species most

* Since writing the above, I have been again to Chobham, and succeeded in obtaining another ♂, and also a ♀.

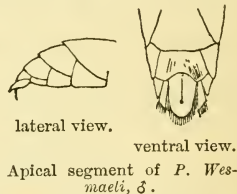
accurately, adopts the name of *neglectus* for it, and says that he has seen specimens so named by Dahlbom himself in which the 3rd sub-marginal cell was triangular, and, therefore, assumes that Dahlbom made an error in his description.

Both Wesmael and Thomson, however, agree that the ♂ to which Dahlbom gave the name of *minutulus* is the ♂ of the present species; and I have, therefore, adopted this name, as it clearly has the priority, having been used by him in his "Dispositio," in 1842; whereas *cellularis* and *neglectus* were only described in 1845.

2. *Pompilus Wesmaeli*, Thoms., Op. Ent., p. 221. Hym. Scand., iii, p. 149.

Same coloration, &c., as *gibbus* and its allies, but easily distinguished, as the ♂ has the apical ventral plate slightly carinated, and armed near the apex with a long pendant spine; the ♀ is more difficult to recognise, but may be known by the somewhat carinated, compressed apical segment beneath.

I called this species in my notes (*ante*, p. 68) *abnormis*, Dahlb., but I see now that it clearly belongs to *Wesmaeli*. *Abnormis* also has the pendant spine in the ♂, but has the base of the ventral plate flat, and an oval fovea before the spine.



Apical segment of *P. Wesmaeli*, ♂.

3. *Priocnemis parvulus*, Dahlb., Hym. Eur., i, p. 460.

Black, with the two basal segments of the abdomen red, the basal segment in the ♂ often with a longitudinal black stripe at its base.

Head and thorax finely punctured, covered with a fine sericeous, and in some lights silvery, pubescence, the pubescence on the coxæ and mesopleuræ denser and more distinctly silvery, wings slightly dusky with a darker stripe through the 2nd and 3rd sub-marginal cells, and a darker patch in the 3rd discoidal cell; beyond the apex of the 3rd sub-marginal is an irregularly-shaped clearer spot, sometimes wanting; the apex of the wing widely dusky. Abdomen shining, 3rd and following segments covered with a fine sericeous-grey pubescence; 5th segment in the ♀ with a few longer hairs, and 6th rather thickly covered with them. Beneath with a few scattered hairs. Apical segment carinated at the apex; ♂ with the anal ventral valve hairy and narrow, slightly widened at the apex and truncate (see figure); posterior calcaria not two-thirds as long as the basal joint of the tarsi.



Apical segment of *Pr. parvulus*, ♂

Length, 6—8 mill.

Very distinct from any of the others of the *exaltatus* group, in the shape of the ventral anal plate of the ♂, and the absence of the clear round spot in the wings of the ♀.

4. *Priocnemis pusillus*, Schiödte, Kroy. Tidsch., 4 heft, p. 327.

Like *exaltatus* in having the clear round spot at the apex of the wings in the ♀, but distinguishable at once by the shape of the anal ventral valve of the ♂, which is rounded at the sides, and deeply emarginate at the apex, and has the margins ciliated with long hairs. The ♀ may be known by its stouter antennæ, its less sharply emarginate prothorax posteriorly, its shorter wings, which have the externo-medial nervure straight across the base of the first discoidal cell, its shorter, more convex, metathorax, and its carinated apical segment beneath.



Apical segment of
Pr. pusillus, ♂

Length, 7—8 mill.

5. *Andrena lucens*, Imhoff, Mitth. schweiz. ent. Ges., ii, p. 67.

Black, shining, head in both sexes wider than the thorax, face clothed with rather long white hairs; vertex with brownish hairs. Thorax rather sparsely punctured, clothed with scattered brownish hairs above; sides thickly clothed with white hairs. Wings slightly dusky, with the 1st recurrent nervure springing from nearly the centre of the 2nd submarginal cell. Scutellum with only a few very scattered punctures, but with a line of punctures down its centre; metathorax clothed with white hairs. Abdomen ovate, very shining, the basal segments with very fine scattered punctures; the rest more densely punctured at their base, but having the extreme apex smooth and impunctate; 2nd and 3rd segments with a white lateral fringe at the apex; 4th with an entire white apical band; 5th densely clothed with white hairs at the apex in the ♀, sparsely so in the ♂; 6th, in the ♀, covered with brownish hairs. Legs black, tarsi in the ♂ entirely testaceous, in the ♀ described from with only the apical joints pale. Scopa in the ♀ silvery-white.

Length, 7—9 mill.

Flying about the flowers, &c., of the heath at Burrow Hill, Chobham, July and August.

This species can only be confounded with *coitana*, and from this, the black clypeus and testaceous tarsi at once separate the ♂, the ♀ are more alike; but the head in *lucens* is wider, the face covered with white hairs, the thorax more hairy, the scutellum almost impunctate, instead of being rugosely punctured all over, as in *coitana*, the body wider at the base, and, therefore, more egg-shaped; the 4th segment with an entire band of white hairs, and the scopæ white, instead of brown. It appears from Imhoff that the colour of the legs varies greatly, the tibiæ being often red.

Holmesdale, Upper Tooting :

7th August, 1880.

ON AN UNDEFINED FACULTY IN INSECTS.*

BY J. H. FABRE.

Ammophila, boring its mine until a late hour of the day, abandons its work after having closed the opening of it with a stone, rambles from one flower to another, goes to a distance, and yet knows how to return on the next day with its caterpillar-prey to the excavated domicile, although the localities may be new and unknown. *Bembex*, laden with its prey, falls with almost mathematical precision on the threshold of its doorway obstructed with sand and confused with the rest of the sandy covering. Where my observation and memory are defective, their *coup d'œil* and remembrance have a certainty which is all but infallible. It may be said that there is in an insect something more subtle than the simple faculty of remembering—a kind of intuition of localities without analogy in man—in fact, an undefinable faculty which I term memory, for want of an expression to designate it. The unknown cannot have a name. In order, if possible, to throw a little light on this point of the psychology of animals, I instituted a series of experiments.

The first had for its subject *Cerceris tuberculata*, the hunter of the *Cleoni*. About ten o'clock in the morning, I captured twelve females which were occupied on the same slope, in the same *bourgade*, either in excavating or provisioning the burrows. Each prisoner was separately enclosed in a cornet of paper, and the whole were put in a box. I then went about two kilomètres from the nests and there released the *Cercerides*, first taking care, in order to recognise them hereafter, to mark each one with a white spot in the middle of the thorax by means of the end of a straw dipped in indelible colour.

The *Cercerides* flew only a few paces in all directions, to and fro; rested on the sprigs of the herbage, passed for a moment their anterior tarsi over their eyes, as if dazzled by the bright sunshine into which they were suddenly brought, then took flight, some sooner others later, and all, without any hesitation, went in a direct line towards the south, that is to say, in the direction of their home. Five hours later I revisited the place where the nests are common, and, on arrival, saw two of my *Cerceris* with the white mark working at the burrows; soon after a third came into the field with a *Cleonus* between its feet; and a fourth soon followed. Four out of twelve in less than a quarter of an hour were enough for conviction, and I deemed it useless to prolong my attention. What four had known how to do the others would do

* Translated from "Souvenirs entomologiques." Vide page 117, *post*.

if they had not already done; and it is very permissible to suppose that the eight absent ones were delayed on their way by hunting their prey, or had already retired to the depths of their galleries. Thus, transferred to a distance of two kilomètres in a direction and by a means of which they could have had no knowledge at the bottom of their paper prison, my *Cercerides* had returned, in part at least, to their home.

I do not know to what distance the *Cercerides* extend their hunting, and it may be that within a radius of two kilomètres the country is more or less known to them. If they had not been carried far enough at the place to which I had transported them, they would then regain their home by their acquired acquaintance with the locality; so the experiment had to be repeated, with a greater intervening distance, and a place of departure that could not be suspected of being known to the hymenopteron.

At the same group of burrows from which I had drawn in the morning I then took nine female *Cerceris*, of which three had been subjected to the preceding experiment, and the transportation was effected in the darkness of a box, each insect being shut up in a cornet of paper. The point of departure selected was the neighbouring town of Carpentras, distant about three kilomètres from the burrows. I determined to release my insects not in the midst of the fields, as at the first time, but in the public street, in the centre of a populous quarter, to which the *Cercerides*, with their rustic habits, had certainly never penetrated. As the day was already advanced, I deferred the experiment, and my captives passed the night in their cellular prisons.

The next morning, about eight o'clock, I marked them on the thorax with a double white spot, in order to distinguish them from the former captures, which bore only a single spot, and I set them at liberty, one after the other, in the middle of the street. Each released *Cerceris* rose up vertically between the two rows of houses, as if to disengage itself as quickly as possible from the defile of the street and obtain the wide horizon; then, clearing the roofs, it launched out immediately with a hasty flight towards the south. It was from the south that I had brought them into the town; it was at the south they would find their burrows. Nine times, with my nine prisoners set free one after the other, I had this striking example of an insect, carried into a district entirely new to it, not hesitating as to the direction it should take to return to its nest.

Some hours later I was at the burrows. I saw several *Cerceris* of the first lot, recognisable by the single white spot on the thorax, but

I saw none of those I had lately released. Had they not known how to regain their home? Were they on a hunting expedition, or had they really concealed themselves in their galleries in order to calm the emotions of such a trial? I do not know. The next day I made another visit, and this time I had the satisfaction of finding five *Cercerides*, with a double white spot on the thorax, as actively at work as if nothing extraordinary had happened. A distance of at least three kilomètres, the town with its houses, its roofs, its smoky chimneys—things all new to these free countrymen, had been no obstacles to their return to their nest.

Taken out of its flock and transported to enormous distances the pigeon promptly returns to the dove-cot. If we draw a proportion between the length of the passage and the bulk of the creature, how much the *Cerceris* transported to a distance of three kilomètres and returning to its burrow will be superior to the pigeon! The bulk of the insect is not a cubic centimètre, and that of the pigeon amounts to quite a cubic decimètre, if it do not exceed it. The bird, a thousand times larger than the hymenopteron, should, in order to rival it, regain the dove-cot from a distance of 3000 kilomètres, three times the length of France from north to south. I do not know that a traveller-pigeon has ever accomplished such a feat. But power of wing, and still less clearness of instinct, are not qualities to be measured by the mètre. The relations of bulk cannot here be taken into consideration, and we can only see in the insect a worthy rival of the bird without deciding which has the advantage.

To return to the dove-cot and the burrow. When the pigeon and the *Cerceris* are artificially removed from home by man and transported to great distances into regions hitherto unvisited by them, are they guided by remembrance? Can memory serve them for a compass when, arrived at a certain elevation, they may recover the lost point and start forth, with all their power of flight, on the side of the horizon where their nests are to be found? Is it memory which traces their route in the air to traverse regions they see for the first time? Evidently not; there can be no remembrance of the unknown. The hymenopteron and the bird know not the places in which they find themselves; nothing can have informed them of the general direction in which their displacement can have been effected, for it was in the darkness of a close basket or of a box that the journey was made. Locality, orientation, are unknown to them; nevertheless, they are found again. They have, then, for guide more than simple remembrance; they have a special faculty, a kind of topographical sense, of which it is impossible for us to have any idea, not having anything analogous to it.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

II. PSEUDO-NEUROPTERA (IN PART) & NEUROPTERA-PLANIPENNIA

BY R. McLACHLAN, F.R.S., &c.

As a first instalment toward the working-out of the materials collected in Portugal by the Rev. A. E. Eaton—who published Introductory Notes on his tour in the last No. of this Magazine (pp. 73—79),—I submit a List of certain of the *Neuroptera*. The *Planipennia* are complete, but the *Pseudo-Neuroptera* yet want the portions relating to the *Perlidae* and *Ephemeridae*, which will probably be furnished hereafter (either wholly or in part) by Mr. Eaton himself. The *Trichoptera* (which formed by far the bulk of the collection) are so rich in new forms, that it may probably be found impossible for them to appear in this series of notes in the first instance, but a List, with localities, &c., will be hereafter given, so as to maintain the uniformity of the series.

Mr. Eaton attended only very casually to the insects treated upon in this paper, but the discoveries are valuable, for, with the exception of some of the *Odonata* (of which De Selys indicated 17 species as Portuguese in 1850, most of which are not the same as those here enumerated), almost everything here is noticed as Portuguese for the first time. Perhaps the most interesting are *Myopsocus Eatoni*, *Gomphus Graslini*, *Amphieschna Irene*, and *Sisyra Dalii*, the first especially, as adding a genus to the European Fauna.

PSEUDO-NEUROPTERA.

TERMITIDÆ.

Termes lucifugus, Rossi.—One winged ♀ found drowning in a reservoir at Cintra, 27th April, the only winged *Termes* seen during the tour. Also soldier and larva found under a stone at the foot of a chestnut tree at Ponte de Morcellos, the only occasion upon which apterous forms were noticed.

PSOCIDÆ.

Myopsocus Eatoni, n. sp.

Head yellowish-grey, rather thickly spotted with deep black, the ocelli placed in a larger black spot, front with somewhat undulating deep black longitudinal lines, closely placed, those in the middle shorter than the others; labrum blackish, with a central yellowish spot. Antennæ whitish-yellow, pilose, the apex of each joint more distinctly whitish, preceded by a broad ante-apical black band. Palpi blackish, with pale rings. Thorax and abdomen fuscous, varied with yellowish (or *vice versa*). Legs yellowish: coxæ blackish; trochanters with a fuscous mark; femora fuscous or blackish externally, with indications of two maculose ante-apical black

rings; tibiæ finely spotted with black, and with a broad apical black ring; tarsi having the 1st joint pale, the 2nd and 3rd blackish. Anterior-wings semi-opaque, grey, thickly spotted and clouded with fuscous, *but with a very distinct curved median pale space under the "forked" vein*; the costal margin and all the neuration closely spotted with deep black; pterostigma triangular, not darker, but with a faint yellowish (or greenish) tinge; extreme apex slightly reddish. Posterior-wings greyish-hyaline, with darker neuration, and a darker greyish clouding along the inner margin. Expanse, about 8 mm.

[Notes on the recently-killed insect, made by Mr. Eaton, prove that the body-colours are much changed: according to these notes, the head is greenish-ochreous (with the black spots and lines above noticed); the ground colour of the antennæ pale greenish-grey. Eyes dark greenish-grey, freckled with black. Thorax above greenish-grey, freckled with black; sides for the most part black. Abdomen above dull greenish-ochreous, the penultimate segment fuscous; there is a fuscous spiracular line on each side, a dorsal fuscous line, and obsolete fuscous lines on each side of it].

One example (probably ♂) on a bridge over a stream near Silves, Algarve, 16th May.

N.B.—The genus *Myopsocus* (Hagen, 1865) is new for the European Fauna. It has the neural characters of *Psocus*, but has 3-jointed tarsi, and thus stands in the same relative position with regard to *Psocus* as *Elipsocus* does with regard to *Cæcilius*. The described species are *M. lugens*, Hagen (N. America), *unduosus*, Hagen (Ceylon), *griseipennis*, McLachl. (Australia), and *fraternus*, McLachl. (Assam). Hagen indicates a species from Fiji, and I have one from New Zealand. All are remarkable (and *M. Eatoni* is no exception) for the coloration, which approaches that of *Psocus variegatus*. Mr. Eaton's discovery of a European *Myopsocus* is of the greatest interest.

Stenopsocus cruciatus, L.—One example from Silves.

Cæcilius flavidus, Stephens.—One example from Ponte de Morcellos, 12th June.

ODONATA.

LIBELLULINA.

Platetrum depressum, L.—One adult ♂ from between Coimbra and São Antonio, 3rd June.

Sympetrum striolatum, Charp.—Two ♀ from a hill S.E. of Silves, 16th May, and two ♀ from between Coimbra and São Antonio, 3rd June; all immature.

GOMPHINA.

Onychogomphus forcipatus, L.—One ♂ and one ♀, São Marcos da Serra, 23rd May, one ♂, Ponte de Morcellos, 12th June. These are

somewhat intermediate between the ordinary northern form and the southern race known as *ungiculatus*, V. d. Lind., but more approach the former; the inferior appendages of the ♂ are totally yellow.

Gomphus Graslini, Rambur.—One ♀, Cea, 1692 feet, 8th June. This very local species has hitherto only been known from the west of France. The Portuguese ♀ appears to agree sufficiently with the description.

Gomphus pulchellus, Selys.—One ♀, São Marcos da Serra, 23rd May, one ♀, on the road from Lisbon to Cintra, 31st May.

Cordulegaster annulatus, Latr.—Cea, one ♂ and one ♀, 9th and 11th June, one ♂, Salamonde, 30th June, over 2000 feet. Of the typical northern form, and not approaching the race *immaculifrons*, Selys, usual in the South of Europe.

ÆSCHNINA.

Amphiæschna Irene, Fonsc.—One ♂ at a stream near Agualva on the road to Cintra, 31st May. A very interesting addition to the Fauna of the Iberian Peninsula. This species is the sole European representative of an otherwise exotic group of forms.

CALOPTERYGINA.

Calopteryx splendens, Harris (race *xanthostoma*, Charp.).—One adult ♂ from near São Marcos da Serra, 22nd May.

Calopteryx virgo, L. (race *meridionalis*, Selys).—One somewhat immature ♂, from the Estrella, 5th June.

Calopteryx hæmorrhoidalis, V. d. Lind.—One ♂ and two ♀, near Monchique, 18th and 19th May, one ♂, between Coimbra and São Antonio, 3rd June; the latter approaches the form usual in the South of France.

AGRIONINA.

Platynemis acutipennis, Selys.—Two ♂, near São Marcos da Serra, 22nd May.

Ischnura Graellsii, Rambur.—One ♂ near Lisbon, 22nd April, two ♂ and two ♀ near Almodovar, 7th and 8th May, one ♀, São Marcos da Serra, 22nd May. There is some amount of variation in these individuals: in the ♂ from Lisbon, and in two of those from near Almodovar, the blue humeral lines on the thorax are totally obliterated; in another ♂ from the latter locality they are continuous but narrow: in a ♀ the 8th segment is totally black above, in another ♀ it is blue for the greater part.

Agrion puella, L.—Two ♂, São Marcos da Serra, 22nd May.

Agrion Lindeni, Selys.—One ♂ from Aldea de Neuves, 8th May, one ♀ near Lisbon, 23rd April.

Pyrrhosoma minium, Harris.—One ♀ from the slopes of Picota, 20th May, three ♂, Ponte de Morcellos, 14th June.

N.B.—Of the fifteen species of Dragon-flies here recorded, the following were indicated as Portuguese by De Selys in his "Revue des Odonates," 1850, viz.: *S. striolatum*, *O. forcipatus*, *C. hæmorrhoidalis*, and *I. Graellsii*, but he noticed thirteen other species not caught by Mr. Eaton, so that twenty-eight species have now been recorded for the Portuguese Fauna.

All the fifteen species have been noticed in Spain, excepting *G. Graslini* and *A. Irene*. The number of recorded Spanish species is about forty-three, most of which no doubt also occur in Portugal.

PLANIPENNIA.

SIALIDÆ.

Sialis lutaria, L.—One ♀, Cintra, 27th April, in the ordinary condition. There is also one ♂ from near Salamonde, 2003 feet, 30th June, that I refer here with some hesitation. It has the dark coloration of *S. fuliginosa* (and even intensified), yet the anal structure is that of *lutaria*, only that the terminal ventral lobe appears slightly shorter, and slightly less obtuse at its apex. It is distinctly not the Spanish *S. nigripes*, Ed. Pict. (which I cannot separate from *fuliginosa*, *vide ante*, p. 62). At present, therefore, in the absence of sufficient materials, I am forced to consider it *lutaria*, with possibly slight modification in the anal parts, and with the coloration of *fuliginosa*.

CONIOPTERYGIDÆ.

Coniopteryx aleyrodiformis, Stephens.—Two examples from Olivaes, near Lisbon, 24th April, two from Cintra, 27th April. The antennæ are about 30-jointed, but in one sex (perhaps the ♀) the joints are shorter and thicker than in the other. Supposing this to be an actual sexual difference, it is clear that *C. tineiformis* must be distinct, and not a sexual form as I was once inclined to believe.

OSMYLIDÆ.

Sisyra Dalii, McLachlan.—Ten examples, nine from near Cintra, 31st May and 1st June, one from between Almodovar and São Barnabe,

12th May. These do not differ from English examples, excepting that the blackish axillæ of the furcations and the transverse veinlets are rather darker. The number of transverse veinlets is very variable.

HEMEROBIIIDÆ.

Hemerobius subnebulosus, Stephens.—One ♂ from near Almodovar, 8th May, one ♂ from the slopes of Picota, about 1650 feet, 20th May, one ♀ between Coimbra and São Antonio, 3rd June, two ♂ from Cea, 1692 feet, 6th and 8th June. These are much less smoky than the ordinary British form.

Hemerobius limbatus, Wesmael.—Two from Cintra, 27th April, three from Cea, 8th June, one from Villa Real, 25th June; all ♀. They do not differ from British examples.

CHRY SOPIDÆ.

Chrysopa vulgaris, Schneider.—One example, Cintra, 1st June (also one example belonging to the Lisbon Museum).

Chrysopa septempunctata, Wesmael.—One example, Cintra, 1st June (also in the Lisbon Museum).

Chrysopa formosa, Brauer.—One example near Villa Real, 23rd June (also in the Lisbon Museum).

Chrysopa nigro-punctata, Ed. Pict.?—Two near Cintra, 28th and 29th April, one near Cea, 11th June. Further materials seem to prove that *nigro-punctata* is not so distinct from *flavifrons* as it at first appeared to me (*vide ante*, p. 62), but I refer Mr. Eaton's examples to the former rather than to the latter.

Chrysopa Picteti, McLachlan (= *thoracica*, Ed. Pict., *vide ante*, p. 63).—One from between Coimbra and São Antonio, 3rd June, one from near Villa Real, 25th June. Fresh examples are deep green with a yellow dorsal vitta, not noticed in the original description of *thoracica*.

Chrysopa aspersa, Wesmael.—Seven examples from a hill S. W. of Almodovar, beaten from cork-oak, 8th May, one from Cintra, 1st June, one from between Cea and São Romão, 9th June, three from near Villa Real, 22nd, 24th, and 25th June. Excessively variable in the spotting of the thorax, &c., even in individuals from the same locality; mostly of small size as compared with examples from Northern Europe. I have never been able to satisfy myself that *prasina* of Burmeister is more than a strongly marked form, and if so, that name has priority over *aspersa*.

There is also a single example of another species of *Chrysopa*, distinct from any of those above recorded, from near Silves, 16th May, perhaps allied to *viridana*, but it is so discoloured that identification appears impossible.

ASCALAPHIDÆ.

Ascalaphus bæticus, Rambur.—One male on a hill S. of Silves, 17th May (another seen), not quite of the typical Spanish form, but more approaching a variety from Catalonia described by De Selys in the *Compt. Rendus Soc. Ent. Belg.*, April 3rd, 1880.

PANORPIDÆ.

Panorpa meridionalis, Rambur.—One ♂ and two ♀, Cintra, 27th April, one ♀, Sabugueiro in the Estrella, 5th June, one ♂, Cea, 9th June, one ♂ and one ♀ near Salamonde, 30th June. All the examples that I have seen from Spain and Portugal are smaller and less strongly marked than those from the French Pyrenees. It is the only *Panorpa* recorded from the Iberian Peninsula.

Lewisham, London: *September*, 1880.

ON THE SINGULAR NEW SPECIES OF *PLUTELLA* (ALLIED TO *P. CRUCIFERARUM*) COLLECTED IN SPITZBERGEN, IN 1873, BY THE REV. A. E. EATON.

BY H. T. STAINTON, F.R.S.

The insects in question were placed in my hands more than six years ago, but pressure of business of various sorts has hitherto prevented my giving them the attention which they merited. Specimens were submitted to Professor Zeller, in 1874, who wrote his opinion on them May 29th of that year, but as he wished that his views on the specific distinctness of the specimens sent to him should be confirmed by myself, the matter has stood over till I had the necessary leisure to relax and set out the Spitzbergen specimens, which Mr. Eaton had collected.

I should premise that of all the *Micro-Lepidoptera*, I know of no more cosmopolitan species than *Plutella cruciferarum*, and, therefore, it would have appeared to me perfectly natural had it also occurred at Spitzbergen.

One other point to be noticed is the very peculiar markings on the antennæ of the normal *Plutella cruciferarum*, which, in bred specimens of the insect, are so strikingly conspicuous.

The stereotyped description of these antennæ is: "whitish, annulated with fuscous;" but the peculiarity is, that these fuscous annulations are occasionally confluent, and form fuscous patches, one of these is about the middle of the antennæ, and there are three more towards the tip. A similar character may be noticed in the antennæ of *P. annulatella*, and a modification of it in the antennæ of *P. porrectella*, for in this species there is no fuscous blotch in the middle of the antennæ, but only the three towards the tip.

Now, the peculiarity of the antennæ of these Spitzbergen specimens, for which Professor Zeller has proposed the name of *Plutella polaris*, is that the antennæ are entirely pale fuscous, with only faintly paler annulations, and this character appears perfectly constant in all the seven specimens I have before me, not a vestige of the dark patches in the antennæ is to be seen.

Professor Zeller's remarks, dated May 29th, 1874, are as follows:—"The two ♂ you send me as *Plutella cruciferarum* appear to me very remarkable. They are of the size of the largest *P. cruciferarum*; their antennæ are pale brown, paler annulated, very different in appearance from those of any true *P. cruciferarum*. Head and thorax (except the shoulders) pale griseous.

"The anterior-wings have the dorsal vitta pale griseous, obsoletely dentate interiorly, and rudely marked with black dorsal spots, and the cilia unicolorous pale griseous. The posterior-wings are broader towards the end than in *P. cruciferarum*, and, consequently, more suddenly pointed. If your other specimens agree in these particulars with the two now before me, they must certainly be a good new species, for which I should propose the name of *Plutella polaris*, with the following diagnosis:—

"*Antennis fuscescentibus obsolete dilutius annulatis, capite thoracisque medio fuscescenti-griseis; alis ant. cinereo-fuscis, vitta dorsali ochraceo-grisea ante medium obsolete sinuata, in margine grosse nigro-punctata, ciliis unicoloribus ochraceo-griseis; alis post. breviter acuminatis.*"

I would add that the anterior-wings seem to me decidedly broader than in the normal *P. cruciferarum*. All the seven specimens show distinctly the dorsal spots noticed by Zeller.

The Rev. A. E. Eaton captured these specimens July 21st and 24th, 1873, at Wide Bay, Spitzbergen.

Mountsfield, Lewisham :

September 13th, 1880.

DESCRIPTION OF A NEW SPECIES OF *BRAHMÆA* FROM JAPAN.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Some years since, when I enumerated the species of *Brahmæa* (P. Z. S., 1866, pp. 118—121), I could only muster four, as follows:—

1. *Brahmæa Certhia*, Walk. (*nec* Fabr.), = *B. conchifera*, Butl.
2. „ *Whitei*, Butl.
3. „ *Petiveri*, Butl., = *Certhia*, Fabr.
4. „ *Lucina*, Drury.

Three more species have subsequently been added to the genus by myself, one by Felder and one by Rogenhofer; the *B. Wallichii* of Gray has also been recognised as distinct from the species with which it was formerly represented; the genus now stands as follows:—

SECTION I.

1. *Brahmæa Lucina*, Drury. Sierra Leone.
- *2. „ *Swanzyi*, Butler. Fantee and Old Calabar.

SECTION II.

3. *Brahmæa Certhia*, Fabr. (= *lunulata*, Brem., = *Petiveri*, Butl.). Chusan; North China.
- *4. „ *Ledereri*, Rogenhofer. Asia Minor.
5. „ *Mniszechii*, Felder. Japan.

SECTION III.

- *6. *Brahmæa japonica*, Butler. Yokohama and Nikko.
7. „ *nigrans*, n. sp.

Nearest to *B. japonica*, but differing in its slightly smaller size, narrower secondaries and altogether blacker coloration; the white bands on the body are confined to the front of the head and collar; the back of the collar and margins of the tegulæ are grey, the remainder of the thorax above is black, the abdomen blackish-brown; the ground-colour of the primaries does not show the pink tint of *B. japonica*, but is sordid white, all the wavy black lines are wider, those across the disc being of a purplish-slate colour, the basi-costal area is broadly suffused with dark greenish-black; the central belt is very much constricted above the internal ocelloid patch, is of a dull greenish-white colour, and the little pupillated black spots upon it are more numerous, and, to a great extent, connected; the submarginal spots are more widely separated; the secondaries have a much narrower basal area, less suffused with blackish (not black) than in *B. japonica*, the belt which limits it externally is much more abruptly angulated, of a sordid white colour, and traversed by a simple greyish stripe; the disc is of a pale greyish-brown tint, is wider than in *B. japonica*, and the lines which traverse it are increased in number by one, and are of a dull purplish-brown colour; the submarginal wavy belt, is similar, but the outer border is distinctly narrower, and of nearly uniform width throughout: on the under-surface the prevailing colour is smoky-grey, the ground-colour showing no

trace of the bright sandy-yellow of *B. japonica*, the basal area is more suffused with blackish, the central whitish belt more conspicuous, the submarginal white undulated stripe sharply defined, and the outer border dark smoky-brown; the body below is smoky-grey, instead of ochreous: expanse of wings, 3 inches, 8 lines.

Japan (Coll. O. Janson).

It is unfortunate that the exact locality of this species cannot be ascertained.

*8. *Brahmæa Whitei*, Butler. Darjiling.

*9. „ *conchifera*, Butl. Silhet and Darjiling.

10. „ *rufescens*, Butl. N. E. Bengal.

*11. „ *Wallichii*, Gray. Nepal.

I have put an asterisk to those species represented in the National Collection.

British Museum: August, 1880.

DESCRIPTIONS OF TWO NEW SPECIES OF *COLEOPTERA* FROM CENTRAL AMERICA.

BY D. SHARP, M.B.

The two descriptions now sent for publication were drawn up by me several years ago, at a time when Mr. Belt submitted to me for examination certain portions of his important collection of Central American *Coleoptera*. Since that time the lamented decease of the talented scientist has occurred: and as his collections are now being studied for description of new species by specialists, it seems desirable to utilize by publication these descriptions which were made long since. The two species belong to well-known genera, viz., *Smilicerus* of the *Elateridæ*, and *Tesserocerus* of the *Platypides*.

SMILICERUS BELTI, *n. sp.*

Elongatus, angustulus, sub-parallelus, tomentosus, niger, elytrorum basi, prothoracis lateribus, prosternique medio, fulvis; antennarum apice flavescente; elytris ad apicem evidenter spinosis.

Long. 8 mm., *lat.* 1½ mm.

Antennæ broad and flat, moderately long, densely pubescent, black, with the 11th joint yellowish, and the 10th dirty yellowish: 2nd and 3rd joints quite short and small, but the 3rd not so small as the 2nd. Head black, deeply punctured, with two patches of fine, scanty, yellowish pubescence on the middle: forehead limited in front by a curved raised line. Thorax very elongate, sub-parallel, the hind angles but little divergent, moderately produced, but their extremity truncate: the middle is broadly black, each side is brownish, and on this brown part is a band of yellowish or golden pubescence. Elytra elongate, striated, the striæ are more distinct towards the extremity, and are punctured, but the punctuation is only distinct on the basal portion, their apex is truncate, the truncature being terminated on each side by a

distinct tooth; the basal portion of the elytra is brownish, but the apex is black, the black colour occupying nearly the half, the scutellum is also black, and the suture is very narrowly blackish. The under-side is black, with the middle and the hind angles of the thorax tawny, and the trochanters and extreme base of the femora are also of that colour: the last ventral segment is produced into a sharp tooth in the middle.

This species is closely allied to *Smilicerus Sallei*, Cand., but has the black colour at the extremity of the elytra more extensive, and differs also in other small respects, so that I had no doubt when comparing it with the type of *S. Sallei* in Mr. Janson's collection, that the two were distinct.

Found at Chontales, in Nicaragua, by Mr. Belt.

TESSEROCERUS BELTI, *n. sp.*

Sub-cylindricus, ferrugineus, sat nitidus, thorace parcissime punctato; elytris seriatim punctatis, interstitio tertio basi latiore, confertim granulato.

Mas, *vertice dense villosa, scapi antennarum processu funiculi insertationem valde superante, a basi ad apicem dense longeque villosa.*
Long. 11 mm.

Fem., *vertice parcius villosa, scapi antennarum processu funiculi insertationem longe superante, a basi ad apicem longe sat dense villosa.*
Long. 10 mm.

♂. Antennæ inserted on a long curved process, somewhat below its middle, this process is not clavate towards the extremity, but is very densely fringed with long pale hairs; the whole of the upper part of the head is also very densely set with such hairs. The thorax has, in the base in front of the middle, a patch of strigose punctures divided into two by a fine channel; the apex of the elytra has, in front of the vertical portion, a small tubercle on the alternate intervals, the vertical portion is densely set with hairs, and its margin simple.

♀. Antennæ inserted as in the male, but the process not quite so long, and its fringe not nearly so dense: the upper part of the head has only a few hairs; the patch of strigose punctures on the thorax is quite rudimentary. The elytra are rather shorter and rather broader at the apex, the sutural tubercles are separated by a wide depression, the vertical apex is less densely pubescent, and its margin is at the apex broadly explanate.

This remarkable member of the *Platypides* was found at Chontales by Mr. Belt, after whom I have the pleasure of naming it. It is one of the largest species of the family, and should be placed at the end of the genus near *Tesserocerus Spinolæ* and *insignis*, but should apparently form a distinct section, because the female, as well as the male, has the process of the scape much prolonged beyond the point of insertion.

Thornhill, Dumfries:
August 11th, 1880.

Vanessa Antiopa near Birmingham.—I saw *Antiopa* yesterday, stopped my carriage and tried to catch it in my hat, but failed to do so, I am sorry to say. It was close by Cannon Hill Park near here.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston, Birmingham : *September 1st, 1880.*

Vanessa Antiopa near Virginia Water.—It may interest your readers to learn that a very good specimen of *V. Antiopa* was caught by a friend of mine, Mr. Montague, near Virginia Water, as early as August 15th, and after a series of adventures is now in my possession in excellent preservation.—HAROLD J. ADAMS, St. John's College, Cambridge : *September 4th, 1880.*

Vanessa Antiopa at Box Hill.—A young gentleman lately saw two examples of this butterfly at Box Hill, Surrey, but although he knew the species, yet being one of those persons who keep only one specimen of a species, he caught but one and left the other, for which latter proceeding he has been sadly upbraided by his acquaintances.—A. H. SWINTON, Binfield House, Guildford : *September 10th, 1880.*

Vanessa Antiopa at Herne Bay.—I took a fine specimen of the Camberwell Beauty on the 26th of August last, at sugar, in Herne Bay.—SAMUEL M'CAUL.

Vanessa Antiopa at Eastbourne.—A specimen was recently taken on a road in Eastbourne, and is now in my possession, though in rather a dilapidated condition.—A. WALKER, The School House, Norwich : *September, 1880.*

Vanessa Antiopa at Headcorn.—I captured a specimen of *V. Antiopa* not far from my house on August 24th.—A. E. STUART, Shenley House, Headcorn : *August 29th, 1880.*

Vanessa Antiopa in Devon.—A specimen of the Camberwell Beauty was captured in my garden yesterday. It was first seen resting on a fallen Quarrendon apple, to which, on being disturbed, it returned after a short flight, and was then caught.—JOHN ELLIS, The Elms, Chudleigh : *August 31st, 1880.*

Vanessa Antiopa in Kent.—*Vanessa Antiopa* has been twice taken in this neighbourhood in the first week of September, viz., once at Knowlton and once at Redville.—OXENDEN HAMMOND, St. Albans Court, near Wingham : *Sept. 7th, 1880.*

Vanessa Antiopa at Tonbridge.—I saw a very perfect specimen of the Camberwell Beauty whilst out driving on August 27th last. Not having a net with me, I was unable to catch it.—EDITH C. THOMPSON, Tonbridge.

Vanessa Antiopa in Berkshire.—I captured, a few days ago, a good specimen of the Camberwell Beauty. At the time I caught it, it was feeding on some rotten fruit. I have never before seen one in this locality. A day or two after, I heard of the capture of another specimen at a spot about seven miles from where I caught mine. Does this mean that this year is an unusually good one for the insect? My specimen is large and perfect, and with reference to the disputed point about the difference between British and foreign specimens, the rim around the wings is, in my specimen, a good creamy-white.—C. L. LINDSAY, Ardington, Wantage : *September 8th, 1880.*

The abundance of Orgyia antiqua.—At this season the “Vapourer” is always one of the “common objects” everywhere, for, like the pig in Leigh Hunt’s story, “he goes up all manner of streets”—urban and suburban. But this year he has come out in prodigious numbers, almost rivalling *Plusia gamma* last year. I say *he*, advisedly, for as is well known, the females cannot fly for want of the *de quoi*. On every day, and all day long, lately, the males perform their gyrations about this house, half-a-dozen being at any moment in view from one window, and the same thing is going on in every direction. It was not so last year, and yet the larvæ in the early summer were very abundant, so that if the quantity of eggs of the last brood was, as is probable, not unusually numerous, the fates have been unusually beneficent to their products. What has been the proportion of females developed? This question, from the retiring nature of the ladies, can never be satisfactorily answered, nor shall we know how many of the gentlemen were involuntary celibates; but if the next generation be again in excess, we may presume that a large number of Benedicks found each a Beatrice; still, this is a hazardous speculation in view of the precedent of last year’s enormous broods of *Plusia gamma*, which have had no such successors this year.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: September 4th, 1880.

Description of the larva of Nonagria fulva.—In the “Manual of British Butterflies and Moths” *fulva* is said to be the commonest of the small species of *Nonagria*, and therein is given from Treitschke a brief description of the larva, yet it appears that in this country no one ever found the larva, until Mr. John Sang, of Darlington, while in quest of another species of larva, found this one, and meeting again with it in the following summer, proved its identity by breeding the insect, as recorded by him in last year’s October Number of this Magazine.

Most obligingly redeeming his promise made to me on that occasion, Mr. Sang has this season again sought successfully for the larva of *fulva*, and kindly sent me for study—first a very young example on the 19th of June,—secondly, on the 9th of July, four fine larvæ approaching maturity, affording me intense gratification in figuring this long-desired subject.

The habitude of the larva is to mine downward within the inner white lower part of the triquetrous flower-stem of *Carex paludosa*, a few inches more or less above the root while young, and nearer the root when full grown: it must be admitted that no external trace of its presence can be seen, for though a slight blackish discoloration does really exist, yet this is so completely masked by the close investing leaves as not to be detected without very strict examination.

When the first little larva arrived I saw it was laid up waiting to moult, and not liking to disturb it then, made no further search for another doubtful smaller larva reported to be in the stem, and this eventually proved to be a Coleopteron of carnivorous propensity to which *fulva* became a prey while in its helpless condition.

From the four larvæ of *fulva* more matured I took away, to figure and describe, the first pupa, which subsequently died from mismanagement during my absence; however, I had the satisfaction of breeding two fine moths on the 18th and 24th of August, and at this last date, while inspecting the plant for removal, I found the fourth, still a larva, though in the stage of changing.

The very young larva is smooth and glossy, of a creamy-whitish colour with a very distinct greenish dorsal vessel showing through the skin; at the stage more advanced it has deeper colouring and decided brownish stripes, as I learn from Mr. Sang.

When nearly or quite full-grown the larva measures from seven-eighths to about an inch in length: seen sideway or *en profile* it tapers very much anteriorly, and very little behind, but when viewed from above on the back it appears to taper only and very abruptly from the front of the third segment to the remarkably small flattened and taper head, the rest of the body being of uniform moderate stoutness though very slightly tapering near the hinder segment; all the segmental divisions are rather deep, and the subdividing wrinkles are deep on the third and fourth segments, slighter and more numerous on the others, and the skin much dimpled along the sides. It is of a pallid flesh-colour ground, having a deeper dirty flesh-coloured internal vessel sliding to and fro within the third, fourth, and fifth segments; the head is glossy, light brown, the mouth darker brown and ocelli black; the plate on the second segment is pale brown with rather darker front margin; the dorsal stripe is pale yellowish flesh-colour very softly defined between two broadish stripes of faint pinkish grey-brown, followed below by another broad stripe of the pallid flesh-coloured ground, and this again by a broad stripe of pinkish grey-brown, through which is visible the tracheal thread of dark grey whereon the black spiracles are situated: the rather rough anal plate is light brown, and a narrow plate also on the front part of the anal segment; the dusky brown tubercular dots are most minute, they are, as usual with internal feeders, largest on the twelfth segment, and these can just be discerned (with aid of a strong lens), and that each bears a short bristle; the ventral surface is pale flesh-colour, the anterior legs light brown, the whole skin shining. When about to pupate all the stripes disappear and the skin is of a porcelain-white strongly contrasted with the black spiracles.

The pupa is of a slender figure and measures five-eighths of an inch in length, very uniform in substance throughout, the thorax rather short and convexly rounded, the head sloping forward is prolonged with a slight tendency to a beak though rounded off at the very tip; the wing-covers short in proportion to the length of body, from the movable segments of the abdomen below them being longer than usual, the last three taper a little and end in a short blunt thorny projection: the colour is light brownish-ochreous with a faintly darker dorsal stripe, the anal projection dark brown and the whole surface very glossy.—WILLIAM BUCKLER, Emsworth: *September 10th*, 1880.

Bryophila par.—More than twenty years ago I took a pair of a *Bryophila* at Cambridge, which at the time seemed to me to present decided points of difference from *glandifera*, but both Mr. F. Bond and the late Mr. G. R. Crotch, who saw them, referred them to that species as a variety, and I submitted to their decision. I have taken one or two at intervals since; but, last year, having captured ten quite fresh, and observing new points of difference, I sent one to Mr. Barrett, who forwarded it to Prof. Zeller. The latter, at first, returned it as *glandifera*, var. *par*, but has since (Mr. Barrett informs me) agreed with him that it constitutes a distinct species. I will, therefore, now proceed to give, as far as mere description can do it, the main points by which, I think, the two species may be differentiated:

1st.—The lines and markings of *B. glandifera* are much more sharply and distinctly marked than in *B. par*, which has, so to speak, a more mealy look.

2nd.—Though the lines and markings of the two insects are exactly alike, *B. par* has all the lines starting as *dark spots* on the costa, and a decided dark line at the base of the cilia of both wings, but especially the hind ones.

3rd.—*B. glandifera* retains its green tinge after death, which continues for years, if excluded from light. *B. par*, which when fresh and alive is of a much paler green with often a beautiful pink tinge, fades directly it is killed, or when worn, to a dirty brick-colour.

4th.—While *B. par* has only, as far as I know, been taken in this country on old walls at Cambridge, *B. glandifera* is, I believe, a coast species.

Lastly.—*B. glandifera* runs slightly larger than the nearly allied species.

I may add that a form of *glandifera* occurs which has the mealy appearance and indistinct lines of *B. par*, but without the dark costal markings and base of cilia, which are always observable in the latter.

These differences may appear but slight, but to any one who sees a row of the two insects, they will, I feel sure, be sufficient to convince him of their real distinctness. I shall be much obliged to any one who will, next summer, send me full-fed larvæ of *B. glandifera* from the coast.—W. WARREN, Park House, Stubbington, Fareham, Hants: *September 17th*, 1880.

Zelleria insignipennella bred.—In April of this year I beat a hibernated specimen of this insect from an isolated juniper bush in Headley Lane.

On May 17th I beat from the same bush a bright green larva, which was so like that of *C. costella*, that I was just going to throw it away, but remembering the capture of the previous month, I saved it. It spun up the same night and emerged in the middle of June, a fine ♀. As the insect is also taken where there is no juniper for some miles, it will probably be found to feed on some other plant as well.—ID.

Phosphæus hemipterus at Hastings.—On June 29th, I took two ♂ specimens of this rare beetle crawling up a wall in Cornwallis Gardens, Hastings.—E. A. BUTLER, Hastings: *September*, 1880.

Another Colorado Beetle!—The following amusing extract from the "Catholic Weekly Register," of August 21st, 1880, has been forwarded by a correspondent.—EDS. :—

"A Colorado Beetle, which flew in at a surgery door on Saturday, has been captured at Stranraer. It is said to be three-quarters of an inch in length. There was a quantity of larvæ on it when caught, and two days after a number of lively little beetles were disporting themselves on potato and cabbage leaves in their glass prison."

Capture of two of our rarer species of Homalota.—I caught a single specimen of *Homalota planifrons*, ♂, on the sand-hills, Hayling Island, last July, and two or three of *Homalota princeps* under seaweed, at Ventnor, in April, in company with a great number of *Philonthus fucicola*, &c. Dr. Sharp has kindly determined the species for me.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: *September*, 1880.

Otiorrhynchus ligustici, &c., in the Isle of Man.—The following species of *Coleoptera*, found by myself near Ramsey during the last week of August this year, have not, so far as I can gather, been previously recorded from the Isle of Man : *Blethisa multipunctata*, *Amara patricia*, *Philonthus fucicola*, *Otiorrhynchus ligustici*. *Dianöus* was plentiful in waterfalls, but I looked in vain for *Stenus Guynemeri* and *Quedius auricomus*. In fact, beetles of every kind were extremely scarce.—W. G. BLATCH, Green Lane, Smallheath, Birmingham : September 20th, 1880.

Prosopistoma punctifrons.—My colleagues, MM. Joly and Vayssière, in announcing, with justifiable pride, the discovery of the perfect insect of *Prosopistoma* (in the Comptes Rendus of the French Academy, and elsewhere), attribute to me the former possession of an opinion that the insect might be an Ephemerid suited for a continuous aquatic life. I am not sensible of having published such an opinion, nor of having held it. In my remarks on *Oniscigaster Wakefieldi*, in the Journal of the Linnean Society of London, vol. xii (Zoology), p. 145, foot-note (1873), I asked, "Can there be *apterous Ephemeridæ*? and can the imago of *Proso-*" "*pistoma* be in that condition?" It did not occur to me that these words could be so translated as to bear the interpretation put upon them by MM. Joly and Vayssière. In congratulating my colleagues on their discovery, it is necessary to say that I make this explanation solely because certain of my correspondents ask me *where* I have published the opinion attributed to me.—R. McLACHLAN, Lewisham, London : 9th September, 1880.

Reviews.

SOUVENIRS ENTOMOLOGIQUES : ÉTUDES SUR L'INSTINCT ET LES MŒURS DES INSECTES : par J. H. FABRE : Paris, 1879. 324 pp., 8vo.

In this volume the author gives the results of his own assiduous observation, during many years, of the instincts and habits of many European *Hymenoptera* and of *Scarabæus sacer*. An account of the Mason-bee is prefaced by an excellent story of the way in which Natural Philosophy was once taught in a certain College ; there is also a chapter on "La chasse aux Diptères;" and another chapter is devoted to a dramatic recital of the perilous incidents of an ascent of Mont Ventoux in Provence, for natural history exploration—an adventure that narrowly escaped having a tragic termination. All these studies, as the author terms them, are full of novelty and are extremely interesting to the entomologist and physiologist, whether or not we follow the reasoning or admit the conclusions. The charm of the writing is irresistible : we give an extract on another page, but to be fully appreciated, the narratives should be read in the original, for much of the *esprit* evaporates in translation. The work is heartily to be commended to the attention of those who love entomology pure and simple.

Four species are described as new—*Cerceris Antonia*, *Cerceris Julii*, *Bembex Julii*, and *Ammophila Julii* :—the first dedicated to his daughter, the other three, in a few pathetic words, to the memory of his deceased young son, in whom a promising love of flowers and insects was early developed.

DIE LEPIDOPTEREN DER SCHWEIZ, von Professor Dr. HEINRICH FREY. Leipzig, Verlag von Wilhelm Engelmann, 1880. 8vo, 454 pp.

The idea of this book conceived in 1849, "in the sunny days" of the author's "youth" is now happily brought to a satisfactory completion.

Switzerland has for long been the holiday ground for all European Nations, and of late years our pages have shown the increasing number of English Lepidopterists who have spent some happy hours in collecting there. Its varied aspects and the inexpressible charm of its snow-mountains, with their brilliant Alpine Flora, offer a series of attractions, which those who have once experienced them will most readily admit are not easily resisted.

Any one can pass through life without entering Switzerland, but he who has once been there is almost certain to return thither.

The volume before us, very clearly printed (and on paper that it is an actual pleasure to touch), enumerates 2508 Swiss *Lepidoptera*, or if certain varieties (which by some are considered species) be included, the number will be raised to 2829. Like most of those, who have given their attention to the subject for any length of time, Professor Frey is disposed to extend his ideas of the limits of species farther than is generally customary. "Der Artbegriff ist in dem Nachfolgenden weiter ausgedehnt, als es bisher bei den Lepidopterologen (namentlich den industriellen) üblich ist."

Frey's volume is not a descriptive work; there are a few descriptions of new species and varieties, but the older, well-known species are simply mentioned by their long established names (the recent innovations introduced into the last edition of Staudinger's Catalogue, being placed between brackets), and a reference is given to a figure of Hübner, or Herrich-Schäffer, &c., thus, "*Hadena Polyodon*, L. (Monoglypha, Hufn.), (Hb. 82)."

The habits of the larva where known are given, and the months and special haunts of the imago; then follow the actual localities in which the species has been noticed and by whom, and stress is laid on its range in elevation, so that we see at a glance the extent to which any species occurs in the Higher Alps.

In a note at p. 266, we are reminded that the singular genus *Acentropus*, which can hardly fail to occur in such a well-watered country as Switzerland, has not yet been noticed there, although Reutti met with it on the Northern shores of the Lake of Constance. "But," says Frey, "who troubles himself there about such a small white thing."

It is remarked that none of the aquatic *Pyralidæ* attain any great elevation. Frey never saw one of that group at an Alpine Lake.

The introductory chapter, which speaks of the physical geography of Switzerland and its consequent wonderful varieties of climate within such short distances, ranging from the perpetual snow of the higher alps to Locarno on the shores of Lago Maggiore, where we have all the luxuriance of an Italian valley, is a fitting prelude to the work which follows.

The distribution of plants is also touched upon. Then the author starts the question: "Whence come the existing *Lepidoptera* of Switzerland?"

This is discussed through several pages, and then two other queries are pro-

pounded: "Has the Jura range a peculiar Lepidopterous Fauna?" and "Have *Lepidoptera*, which were originally alpine, in descending to lower elevations undergone modifications, transforming them to other species?"

Instances are given which would seem to answer the latter question affirmatively; but, just as the reader is charmed with the field of speculative thought he is entering, the Professor abruptly closes the subject: "Here we quit the enticing field of hypothesis. We turn to the more sober facts. We bring forth our Catalogue."

The following note to *Melitæa Dictynna*, at p. 29, will not be without interest to many of our readers:

"The *Melitææ*, which begin with *Dictynna*, belong to one of the most difficult sections of Lepidopterology. In the year 1878 I again devoted to it much time and labour. Through the kind aid of my friends and correspondents, Messrs. A. Schmid of Ratisbon, B. Möschler and J. Schilde of Bautzen, L. Cafilisch of Chur, W. M. Schöyen of Christiania, and others, with Staudinger's friendly assistance, I had before me for comparison and examination upwards of 300 specimens from the most varied localities. According to my opinion, only one species is sharply separated, namely, the old primary *M. Asteria*, Err., belonging to the glacial epoch. From it next proceeded *M. varia*, Bi., which developed into *Parthenie*, H.-S. From the same alpine type *M. Aurelia*, Nickerl, is likewise derived. Both (*varia* and *Parthenie*) pass into the long-known *M. Athalia*, and, judging at least from northern specimens, there is no sharp demarcation between *Athalia* and *Dictynna*. I possess intermediate Swiss specimens. Between *Athalia* on the one hand and *Parthenie* and *Aurelia* on the other hand, with Schöyen's great mass of interesting material from Christiania and the Dovrefjeld, our usual differential characters founded on German specimens are left more or less in the lurch. In the meanwhile, in accordance with the usual system, I adopt the habitual list of species."

ZOOLOGICAL CLASSIFICATION: a handy book of reference, with tables of the Sub-Kingdoms, Classes, Orders, &c., of the Animal Kingdom, their characters and lists of the Families and principal Genera: by FRANCIS P. PASCOE, F.L.S., &c. Royal 18mo, pp. 328, second edition. London: John Van Voorst, 1880.

At p. 258 of Vol. xiii of this Magazine, we had occasion to notice the first edition of this work, and to point out how really useful it would prove as "a handy book of reference," a recommendation since abundantly justified by our own experience. The welcome with which the first edition was received, and the rapid advancement of Zoological science, have prompted the author to slightly re-model the first edition, and to bring out a second, in a much enlarged form, in which is shown how closely he has kept himself *au courant* with the literature of the subject, although there is too much evidence of inclination to follow one or two authors who, however eminent they may be in their special subjects, can have but little knowledge of the whole. Touching the Insecta, for to these our remarks must (as on a former occasion) be confined, we in some respects prefer the arrangement adopted in the first edition. We know not what induced the author to revert to the old intimate association of the true lice with the bird-lice, and in this respect consider his former ideas much to be preferred. We could object to other points in sequential and ordinal position; but we are fully alive to the multitudes

of opinions that exist. We might take great objection to the assertion that the only special auditory organs in insects are found in some groups of *Orthoptera*. We might object, also, to the *vagueness* of the remark appended to the *Curculionida* (the author's speciality at this time), to the effect that it is "one of those groups in which many of the forms do not seem to be differentiated into species." But we cordially recommend the work as likely to prove of the greatest service as "a handy book of reference." Those who wish to form their own opinions must consult those authorities from whom the author acquired his.

The very marked increase in size of this edition (as compared with the first) results in part from a Glossary of nearly 40 pages, in which most of the terms used in the condensed characters and attributes are explained.

Those of our readers who possess the first edition cannot but have been struck with the evidences of laborious investigation exhibited in it (more especially if they have ever had occasion to attempt such work themselves); and this feeling will be intensified on an analysis of the second.

ENTOMOLOGICAL SOCIETY OF LONDON.—*September 1st, 1880.* H. T. STANTON, Esq., F.R.S., &c., Vice-President, in the Chair.

Miss Emily A. Smith, Assistant State Entomologist of Illinois, was elected a Foreign Member.

Mr. Weir exhibited a ♂ *Odonestis potatoria* in which the upper wing was for the most part coloured as in the ♀, and a ♀ with the coloration of the ♂. Also a variety of *Smerinthus populi*.

Sir S. S. Saunders exhibited six males of *Hylechthrus* bred from *Prosopis rubicola* from Albania, with other parasites bred from the same Bees (or from the briars in which their nests were made), and a new species of *Scleroderma* which he described as *S. ephippium*.

Miss E. A. Ormerod exhibited dipterous galls on *Tanacetum vulgare* found near Brentford. They affected various parts of the plants, but the most curious were on the inflorescence, individual florets becoming much enlarged and standing up far above the common receptacle. [Similar galls on the flowers of *Achillæa* have been attributed by Von Frauenfeld to *Trypeta stigma*.—EDS.]

Mr. Billups exhibited *Polyblastus Wahlbergi*, an ichneumon new to Britain, taken at Ashted.

Mr. Boscher exhibited larvæ of *Smerinthus ocellatus* feeding on *Salix* and on apple, illustrating the variation apparently caused by the food-plant, those on the *Salix* being ornamented with brown spots which are absent in those on the apple.

Mr. Meldola exhibited specimens of *Camptogramma bilineata*, a large number of which had been found dead on the leaves of *Lycium barbarum* by Mr. J. English, attached to the leaves by a fungoid growth analogous to that which affects the common house fly.

Mr. Swinton communicated notes on the light of *Luciola* as observed by him at Turin, in which he affirms that when confined under separate tumblers they flashed their light "alternately and responsive."

DREPANA SICULA BRED FROM THE EGG.

BY WILLIAM H. GRIGG.

It is with much satisfaction I am at last able to record the above circumstance, through my having captured a worn ♀ moth on 4th of July, 1879, and her subsequent laying of thirty-nine eggs, attached to the edge of a leaf of *Tilia parvifolia*; and from these eggs twenty-five larvæ were brought successfully through their first moult by 3rd of August, when five of them were forwarded to Mr. Buckler, who reared three to full growth.

Hatched on the 17th and 18th of July, the little larvæ were at first very restless, unceasingly roaming to and fro over the lime leaves in the nearly air-tight jam pot I confined them in, where, one by one, many succumbed, as if from starvation, and it was not until the third day that I noticed any of the leaves had been attacked, when I was pleased to find some of the larvæ had commenced eating the upper surface close to the edge, and more particularly at the tip of the leaf.

Once got to settle down to their food quietly like rational beings, there was very little more prospecting to be observed, and the remaining larvæ fed up well: the first one spinning together a leaf for pupation on the 27th of August, and the last on 12th of September.

The pupæ were kept out of doors through the winter in an exposed situation, open to the north, and the first moth (a male) put in an appearance on 23rd of May, 1880,* and the next day three more, others followed, and the last on the 1st of June, making altogether sixteen specimens bred. In two instances the moths had not been able to escape from the cocoons, and the others were dried up.

Having now got both sexes out together, the next thing was to try if some of them would pair; the first attempt proved futile, but on placing a male and two females together, the desired end was attained at 10.30 p.m., and this again with three other females; one pair remaining *in cop.* forty-eight hours, an instance the more remarkable as the female laid only ten eggs, and they proved unfertile; the other pairs had separated between 8 and 9 next morning.

These females seemed loth to lay, and preferred to rest on the sides of the glass cylinder, rather than on the spray of lime it enclosed, and for three days scarcely moved, when, on an average, sixty eggs each were deposited on the edge of one or two leaves during the dusk of the evening without any kind of excitement; one moth piled hers up, as if a more equal distribution of the ova were needless fatigue.

* My first and earliest capture of specimens of *sicula* at large, consisted of a much worn pair on the 6th of June, 1874.

Their behaviour fully bore out the sluggish character of the moth when at large, so well known to myself and a few others: we never once having seen it on the wing; and thus in confinement, I noticed on every occasion they had never apparently shifted their position during the day, and only a little before dusk did they move quietly about; just as on a similar occasion, when I had five moths together confined in a cage less than a foot square, where, by 11 p.m., two pairs were *in cop.*, and separated next morning, without either having sustained injury worth mention.

After the experience of 1879, I looked forward to a still more successful rearing of the young larvæ this season, but, in fact, I fared even worse than before, my per centage of loss being very distressing; still, I am somewhat comforted to find the final result has not been entirely unsatisfactory; and am yet hopeful of being in a position next season to supply my friends with this moth.

51, Redland Road, Bristol:
28th September, 1880.

ADDITIONAL NOTES ON THE LARVA OF *DREPANA SICULA*.

BY WILLIAM BUCKLER.

In Vol. xiv, pp. 1—4, of this Magazine is a description of the egg and the larva of *sicula* when first hatched, also of the fully matured larva, and I now offer a few more observations to fill up the hiatus in the early part of its history, that the perseverance and kind help of Mr. W. H. Grigg have enabled me to give, and to thank him herein for both larvæ and ova.

The eggs are laid by the parent moth on the very edges of the leaves, so that when hatched her progeny shall find themselves exactly where their food is most suitable; for however much they may wander at first, it is there, in preference to any other part, the young larvæ invariably begin to feed, on the cuticle of the upper surface; there also they spin a small quantity of silk to rest upon and be secure while moulting.

After a moult, while the larva is but little more than one-eighth of an inch long, the future form is indicated, though the segments are strongly wrinkled and folded across at intervals, and the previous plain chocolate-brown colour is exchanged for russet-brown, relieved by minute dots and transverse bars of yellow.

After the next moult, the larva begins to cut quite through the substance of the leaves, eating out semicircular portions from the edge, it also begins to show on the brown ground-colour, little patches of

very subdued ochreous-yellow in angular forms on the back; five days later it spins a quantity of silk, tying as it were the leaves loosely together, but firmly, for its safety while laid up for another moult, which is accomplished after two or three more days, and then it has the characteristic party-coloured coat of dark velvety-brown and pale cream-colour, the tubercular process appearing on the fourth segment as two short black eminences; it soon spins more silk threads, keeping the leaves partly together, and feeds well until once more laid up for moulting, and this takes place after about a week from the previous change of skin.

Now the rosy-pink colour appears on the belly and ventral legs, and the yellow parts of the back have a thin brown dorsal and fine lateral lines, the yellow being much brighter than before; three distinct shapes of yellow are seen on the back, well defined, and contrasted by the rich dark brown surrounding them, viz., a brilliant pale yellow triangular mark, its base at the beginning of the fifth segment its apex at the beginning of the sixth; an elongated diamond-mark of deeper yellow extends from near the beginning of the seventh segment to near the end of the ninth; another begins on the front of the tenth and includes the pointed tail, relieved on the twelfth segment with a brown chevron: as the larva grows, these yellow marks expand and become united into one long fluctuating shape along the back, as I have formerly described; though I have since then had one variety retain the triangular mark isolated distinctly to the end of its larval existence; and another with the yellow colour rather inclining to drab.

Having referred to my former account of this species, wherein mention was made of two young larvæ dying, rather than eat the lime supplied to them, and that yet only the year before a nearly mature larva had thriven on that food well enough, it is now needful to state that what seemed to me then so inexplicable, received afterwards an easy solution when Mr. Grigg sent me some lime gathered in the haunts of *sicula*, leaves whose smaller size, and qualities of texture and colour, were different from those the little larvæ rejected; it was a great satisfaction, then, on visiting the trees where, without thought of any particular species of lime, I had first gathered food for the adult larva, to find they were *Tilia parvifolia*, and that *T. europæa* also grew at no great distance, to which, by a mischance, the next year at night my footsteps had been directed, an incident proving the importance of having the proper name, when allusion is made to trees or plants as food for larvæ.

REMINISCENCES OF ENTOMOLOGY IN SUFFOLK.

BY THE REV. A. H. WRATISLAW, M.A.

Having struck my tent in the east, and moved to the extreme west of the country, let me endeavour to wake up a few reminiscences of that best of entomological counties, Suffolk, and my own happy hunting grounds at Tuddenham St. Mary's (near Mildenhall) and its neighbourhood in particular.

It is about the 12th of June, the day is bright, the wind south-west, and everything invites the Entomologist, especially the Lepidopterist. Let us visit Tuddenham with its sands, its heath, its little marshes, and its fens. We start a good party in a break from Bury St. Edmunds, and, in about an hour and a half, approach the goal of our desires. We stop about half-a-mile short of the village, and send our conveyance on to the "Anchor." Then a *détour* is made to the right, and, in a few minutes, we are in the midst of rarities. *Lithostege grisearia* is flitting about among the barley and in the neighbourhood of its food plant, the Flixweed (*Sisymbrium Sophia*); *Acontia luctuosa* hastens away as we approach; *Agrophila sulphuralis* darts rapidly from one position to another, and requires a practised eye to see, and a practised hand to catch it; *Heliothis dipsacea* careers wildly about, settling now and then on a flower, when it falls a victim to somebody's whirling net; and now and then *Acidalia rubricata* rises and flits before us, difficult to distinguish and keep in view on some barren patch of ground. Such are our captures on the way to Tuddenham. But we must hasten toward the marsh and fen, or *Melitæa Artemis* will have ceased to fly, whereas we can make another onslaught on *Agrophila sulphuralis* and some of its companions on our return. On we go, and proceed another half mile to the heath, marsh, and fen, or, as it is properly termed, the common. *Artemis* is abundant, as it is every now and then, and is flying vigorously on both heath and marsh, especially where a ring of birch trees form a kind of enclosure, which it particularly affects. Its food plant, the blue or devil's-bit scabious, is abundant everywhere, and I mentally make a note, that search must be made next month for the beautiful larva of *Macroglossa bombyliiformis*, which perhaps may be found by searching, in the same way as that of *fuciformis* is found on the low trailing bines of the honeysuckle. Now down to the fen, in the immediate neighbourhood of which a fair number of specimens of *Hydrelia unca* are captured flying among the long grass. But little else is now found except the brood of the larvæ of *Saturnia carpini*, which has taken possession of quite a district of the meadow-sweet.

Now back to the "Anchor," walk on to the locality for *su'phuralis* and the rest, fill our remaining unfilled boxes, and home on the break to Bury St. Edmunds, well contented with our day.

It is the end of June, and another expedition is organized. *Hydrelia unca* is still on the wing in the fen, but *Agrophila sulphuralis* is getting ragged on the sand, and we find little but *Acidalia rubricata* to reward us. But, stay! as we return somewhat disappointed, we institute a search on the flowers of *Echium vulgare* and *Centaurea scabiosa*. On the former a beautiful specimen of *Dianthæcia irregularis* is found, and another moth, unknown to its captor, is brought me to be named. It is *Dicycla oo*, an insect which I had supposed to be a New Forest moth, and not an inhabitant of so open a country.

It is now July, and my pupils are gone home for their holidays, so I have to make my excursions by myself with one or two friends. There is nothing to speak of in the sandy district except *Spilodes sticticalis*, which is frequently very abundant, and sometimes very finely coloured. However, a friend takes a specimen of *Lytta vesicatoria*, and two or three *Cerambycidæ* are captured as they fly, to the satisfaction of the Coleopterists; but on the marsh and fen, towards 5 o'clock in the afternoon, out comes *Hyria auroraria* in fair number and excellent condition, and a very beautiful little insect it is in its purple and gold livery. But let me not forget to carry on the search for the caterpillars of *Macroglossa bombyliiformis*. I look for leaves of the blue scabious with holes bitten in them, and am several times disappointed as I turn them up, for other things bite holes in them occasionally besides the expected caterpillar. But patience and perseverance! Another and another plant is visited till I come to a region where there has evidently been a considerable deposit of eggs, and plant after plant yields a bright green larva with red markings on the sides, on the under-side of one of its leaves, and I return with nineteen caterpillars of *M. bombyliiformis* in my boxes. Those of *Lithostege grisearia*, too, swarm on the Flixweed, but are hardly worth rearing, so inferior are the bred specimens to those that are taken in their wild state.

With August comes the time for sweeping, and the abundant *Silene otites* yields its store of the caterpillars of *Dianthæcia irregularis*, with an occasional larva of *Heliothis dipsacea*. But the latter larva and that of *Heliothis marginata* abound more on the banks which edge the road through the open fields from Higham to Tuddenham. The imagos of *Eremobia ochroleuca* and *Agrotis valligera* are found on the *Centaurea scabiosa*.

I was not present when five beautiful specimens of *Vanessa Antiopa* were captured in a rough field adjoining Tuddenham Common by an old pupil (Mr. John Edwards), as they sucked the saccharine moisture from the trunks of some birches less stunted than those which grow on the common. But I had a glorious evening in a field about half-a-mile from Tuddenham, where a fresh brood of *Acidalia rubricata* appeared *en masse*, flitting about like pink and purple stars in the golden sunshine of the declining sun, about seven o'clock in the evening. So abundant were they, that I had twenty-nine choice specimens in my boxes, and a number more in my net.

It is now the middle of August, and a larva-hunting expedition is organized. Many a blow is dealt to the low birches and oaks that abound on the heath and marsh, and many are the caterpillars that fall into the umbrellas. That of *Notodonta dromedarius* is especially abundant on the birches, and so is that of *N. camelina* on both birches and oaks. *N. dodonæa* and *chaonia* also fell occasionally from the oaks; nor is it very often that the caterpillars of *N. dictæoides* with their long yellow stripe, and of *Acronycta leporina*, usually with white but now and then with yellow hairs, put in a welcome appearance. The larger leaved willows produced *Dicranura furcula*, and *Salix repens* is in places studded with the neat little dwellings of *Clostera reclusa*. Occasionally, too, an oak will yield a welcome larva of *Drepana hamula*, and *D. falcataria* swarms upon the birches; nor is *Notodonta ziczac* absent from the willows, or *Geometra papilionaria* from the birches. But we must not neglect the *Galium verum* in the sandy district, or miss the exquisite caterpillar of *Anticlea sinuata*, of which I have often taken a boxful, and which may be swept or searched for according to the taste or convenience of the Entomologist.

Such was Tuddenham in its palmy days; but now, alas! the professional collector has invaded it, and the amateur finds much less to reward him in the way of such larvæ as that of *Dianthæcia irregularis*. But the winged game is as abundant as ever, only it must be remembered, that many moths, *e. g.*, especially *Acidalia rubricata*, change their station according to cultivation, and are not found exactly in the same locality year after year. Let Tuddenham be visited in the second and last weeks of June, and, with favourable weather, the Entomologist will be pretty sure to see and find things there which he will not easily find in abundance in any other locality.

P.S.—I cannot remember, for certain, whether it was in July or August that an elm near Icklingham, in the same district, produced the exquisite little Tortrix, *Argyrolepis Schreibersiana*. I have, therefore, not included it among the captures of any special expedition.

PARTHENOGENESIS IN THE COLEOPTERA.*

BY J. A. OSBORNE, M.D.

In the "concluding remarks" in his treatise on "Wahre Parthenogenesis" (1856), von Siebold says, "Es ist daher jetzt Aufgabe der Entomologen, nach weiteren Beispielen von Parthenogenesis in der Insektenwelt zu forschen;" and on the last page (237) of his "Beiträge zur Parthenogenesis," published fifteen years later, he expresses the conviction that many facts relating to this phenomenon are still to be discovered. The instances of *true* parthenogenesis discussed or referred to in these two works relate to insects of the Orders of *Hymenoptera* and *Lepidoptera*, and to some crustaceans, including viviparous agamogenesis, however, as parthenogenetic, the orders *Hemiptera* and *Diptera* also furnish examples of this mode of reproduction; and for its occurrence in at least one genus of the *Trichoptera* I have the authority of Mr. R. McLachlan, F.R.S.† The possibility of parthenogenetic reproduction in the *Coleoptera* rests only, so far as I am aware—see "Comparative Embryology," by F. M. Balfour, vol. i, p. 64—on the single instance communicated by me to this journal last year (*Nature*, vol. xx, p. 430), and this being so, it seemed desirable to make sure of this point by further research during the season now almost past. Accordingly, I have this year kept a considerable number of females of *Gastrophysa raphani*, laying unimpregnated eggs, and with results which have not only confirmed the previous experience, but much extended it, as I am at present in possession of a living beetle reared from a parthenogenetic ovum. With your permission I shall now endeavour as briefly as possible to give those circumstantial details without which a bald statement of results would not carry with it a rational conviction of the accuracy of my observations.

From beetles gathered in the beginning of last April I had a batch of eggs on the 7th, which hatched out on the 21st of the same month, and on May 13th—15th yielded about thirty pupæ, which were immediately put into separate vessels. On the 20th—22nd appeared the imagines, of which ten subsequently turned out to be females, and were placed together in pots, but not before the greatly enlarged abdomen had given unmistakable evidence of their sex. The first eggs, three batches, were laid on June 2nd (so completing the cycle, from egg to egg, in fifty-six days). On the 12th of the month I found

* Re-printed from "*Nature*," Vol. xxii, pp. 509, 510.

† I fear Dr. Osborne has somewhat misunderstood some remarks of mine in a letter to him. I am very strongly disposed to believe that parthenogenesis exists in certain species of the genus *Apatania* in *Trichoptera*, but it is not proved. All we know is that although the females occur in abundance, no male has yet been discovered. This particularly applies to *A. mutiebris* and *A. arctica*.—R. McLACHLAN.

in one of these batches, consisting of forty-two eggs, thirteen developed, of which two hatched out, the larvæ dying shortly afterwards. Others seemed to have partly hatched, but most eventually perished in the shell. At this time fertilized eggs were hatching in nine days. It appeared to me that several of the thirteen were imperfectly or monstrously developed; one, for example, having only one misshapen (?) mandible; another, excess in number and irregularity in grouping of the eye-spots, &c., &c. Again, on June 17th, I found in a parcel of (twenty-five) eggs, laid June 6th—7th, six which had developed up to the hatching. In the usual course, at the time of hatching, the young larva comes out of the shell clear like barley-sugar, but blackens afterwards; in the case of these parthenogenetic larvæ which do not hatch out, this blackening takes place within the shell. In a third batch, of over twenty eggs, laid June 8th, I found three eggs similarly developed. In the meantime, and afterwards, many dozen batches had been laid, in which, however, I did not detect any development.

A second experiment miscarried; but I was more successful with a third and fourth. From a batch of eggs laid June 5th—6th, I derived pupæ which on July 8th following I placed separately in pots, and obtained from them thirteen beetles, of which seven turned out to be females. About the same time I brought in from the fields some well-grown larvæ, the beetles from which were isolated immediately after their exclusion, and subsequently yielded eight females. These (seven and eight) were all kept in separate pots during the course of the experiment. Of the seven no less than five laid eggs which afterwards developed parthenogenetically. They laid as many as ten parthenogenetic batches among them, but while some of them laid three such batches, others laid only one. These were invariably the first batches laid, and none of the batches laid subsequently contained any viable eggs while the experiment lasted, which was in some cases up to the tenth batch. Of the eight beetles of the fourth group, only one laid one parthenogenetic egg in its first batch. The number of parthenogenetic eggs in a batch varied from one to seven. In four batches there was only one such egg; in three batches five, and in the other four batches two, three, six, and seven respectively. The total eggs in a batch averaged 41.7, and as there were thirty-six parthenogenetic, the proportion over all was 1 in $12\frac{1}{2}$. However, as may be supposed, the proportion in the individual batches varied very much, one small parcel of only eleven eggs having as many as five developed.

In most of these cases also the larvæ perished in the shell. A

few hatched out more or less completely, and died. Two, however (of the seven in one batch), were more fortunate. These came out on July 29th, and for some hours seemed very feeble and barely alive. Next morning I found that one, which subsequently took the lead of its fellow in all respects, had crawled away under cover, and the other was able to follow its example. I could not find that they had eaten anything till the even of the 31st. After that, however, they thrived apace. The larger one passed its first and second moults on the 3rd and 7th of August, the smaller following it on the 4th and 8th. The former pupated on the 14th, and the imago was excluded on the 19th. The latter, having pupated, August 15th—16th, appeared to go on well till the time for the exclusion of the beetle, when its further development became arrested, and it died. The survivor was weakly at first, and rather imperfect always as regards the elytra, which are somewhat small, and do not close in the middle line. It has, however, thriven well, and developed that enlargement of the abdomen peculiar to the female. But up to the present (September 22nd) it has laid no eggs, nor shown any inclination towards males placed in the pot with it.

When it became obvious that no more parthenogenetic eggs were to be obtained from these beetles, I placed the survivors of them in succession in a pot with a (the same) male beetle, with the result that most afterwards laid fruitful eggs in the ordinary way. I mention this because it seems to be in contradiction, as far as these insects are concerned, with the statement of von Siebold ("Beiträge," p. 89): "Es ist nun eine bekannte Sache, dass, wenn Insecten-Weibchen vor der Begattung erst einmal Eier zu legen angefangen haben, ihre Männchen alsdann mit ihren verspäteten Liebesbezeugungen bei ihnen nichts mehr auszurichten im Stande sind."

If now I may be permitted to make a few general observations on some of the points indicated for further inquiry, rather than established, by the foregoing experiments, I would say: (1) that parthenogenesis seems to occur chiefly in the first-laid batches; (2) that it is peculiar to some females, while others appear to be exempt from it; (3) that confinement and domestication, as it were, acting hereditarily, which we already know so profoundly to affect the generative system in the higher animals, appear to favour this mode of reproduction in *Gastrophysa raphani*; (4) that there are degrees of viability in parthenogenetic embryos, so that the development seems to be arrested chiefly at certain points, as at the hatching of the egg and the exclusion of the imago. In this respect the *Gastrophysa* egg behaves very much as the ovum of *Bombyx mori* is reported to do (v.

"Beiträge," pp. 230—232); (5) another point in which *G. raphani* agrees with other parthenogenetically reproductive arthropods is its many-broodedness in a season. There may be three or four generations in direct succession in the year, and there is a constant succession of eggs all the time. In this it appears to differ from any of its allies with which I am acquainted. (6) Finally, the case of *G. raphani* would seem to be one of true parthenogenesis in its most restricted sense—the same beetle which in the unimpregnated state lays sterile eggs, with here and there one capable of development, after receiving the male element, laying eggs which are fertile and develop in the ordinary way. That is to say, the ova are true ova, and not pseud-ova or buds, the parent a perfect female and not an "Amme" like the summer Aphis.

Milford, Letterkenny, Ireland :
September 22nd, 1880.

DR. F. MÜLLER'S DISCOVERY OF A CASE OF FEMALE DIMORPHISM AMONG DIPTERA.

BY BARON C. R. OSTEN-SACKEN.

We owe to Dr. Fritz Müller, in Brazil, the important discovery of the hitherto unknown larvæ of the *Blepharoceridæ*, a very aberrant Family of *Diptera Nemocera*, of which a dozen species are at present known, remarkable for their sporadic distribution nearly all over the world (Europe, Ceylon, North and South America). In connection with this discovery of the larvæ, Dr. Müller publishes another very interesting and novel fact, the existence, in the species observed by him (which he names *Paltostoma torrentium*), of two sets of females, the one of which has the organs of the mouth built upon the plan of the trophi of blood-sucking *Diptera*, while in the other, as well as in the male, the mandibles are wanting. These females differ from each other besides, in the size of the eyes (separated in both cases, while they are contiguous in the male), and in the structure of the last tarsal joint. For details I refer to Dr. Müller's circumstantial and conscientious article in the October Number of the German periodical "Kosmos," and will only add, that these flies were obtained by Dr. Müller in large numbers by cutting open nearly ripe pupæ, but, as it seems, were never found in the open air.

As I have paid some attention to the Family of *Blepharoceridæ*, and am the only person who knows *de visu* all the described species (always rare in collections), I feel bound to make the following remarks, which suggested themselves to me in reading the above-quoted article.

Dr. Müller assumes, as results from the tenor of some passages (especially one on p. 41, left column), that in the *Blepharoceridæ*, as in a great many other *Diptera*, the eyes are contiguous in the male, and separated by a distinct front in the female. But it is just in this respect that the *Blepharoceridæ* differ from most other *Diptera*; their eyes are contiguous in some genera and separated in others, but when contiguous, they are so in both sexes, and when separated, likewise. The weight of this statement is qualified, it is true, by the circumstance that amongst twelve described species of *Blepharoceridæ*, only four are known in both sexes; of the other eight only the males are known, which execute ærial dances and are more frequently caught. It is possible, therefore, that the species observed by Dr. Müller differs from the cases hitherto known, and has the eyes contiguous in the male, while they are separated in the female. Moreover, Dr. Müller states explicitly that he examined the structure of the abdominal appendages of both sets of females, and found them to be the same in both. If it had not been for this statement, one might have suspected that the female without mandibular organs was in reality a male, and that the male with contiguous eyes belonged to a different species.

Another remark which suggests itself to me, is about the generic name of Dr. Müller's species. Dr. Schiner described a male *Paltostoma* as having separated eyes; *Paltost. torrentium* has them contiguous; this would, perhaps, constitute a difference of generic importance.

The statement, finally, that *Paltostoma* occurs in Europe, and has been found on Monte Rosa, is based upon some misconception. The *Blepharocera* discovered on Monte Rosa is *Hapalothrix*, a very abnormal genus in that abnormal Family; it has nothing in common with *Paltostoma* but a superficial resemblance in the venation. *Paltostoma* has been found in South America and Mexico only,

If this article should meet the eye of Dr. Müller, it will perhaps induce him to furnish us with more facts about this interesting question; mature imagos should be caught, and the venation of their wings, as well as the structure of the genital organs, carefully compared.

Errors may easily occur. Thus, Macquart received from the same locality specimens with contiguous and separated eyes, and described them as sexes of the same species. It was found afterwards that they constituted different genera, and that the specimens with contiguous eyes (*Blepharocera*) were the females, while those with separated eyes (*Liponeura*) were the males; exactly the opposite of what one would have expected.

Persons desirous of more information about *Blepharoceridæ*, I

refer to Dr. Loew's article, "Revision der Familie der Blepharoceriden" (Schlesische Zeitschr. f. Entomol. Neue Folge, vi, 1877), and to my "Bemerkungen," &c., in the Deutsche entomol. Zeitschr., 1878, pp. 405—416. Only I beg that, in the latter article, p. 406, line 11 from top, after the word *Hinsicht*, the words *ausserhalb der Familie der Cyrtiden* should be inserted.

Heidelberg: October, 1880.

DESCRIPTION OF THE NYMPH OF *ARYTÆNA GENISTÆ*, LAT.

BY JOHN SCOTT.

Our knowledge of the earlier stages of the insects comprising the Family *Psyllidæ* has, until within the last few years, been of very limited extent, and whether this has arisen from the supposed difficulties attendant upon rearing the creatures, or from what other cause or causes I cannot say. My experience in rearing them has been quite a pleasure, and without the long anxious waiting attached to the rearing of *Lepidoptera*. The system I adopt is precisely similar to that adopted by me when I used to breed *Micro-Lepidoptera*, viz.:—a small flower-pot filled with earth, into which is placed a portion of the food-plant, the young are then put upon it, and the whole covered by a glass cylinder fitting into the rim of the flower-pot. Through the cylinder their actions may easily be observed, as also their habits. Some species live in a crypt formed by the deformation of the leaves occasioned by their attacks, and these are generally enveloped in a fine, flossy, cottony substance, whilst others roam about singly; perhaps the most active of all the young forms I have met with are those of *Arytæna genistæ*, Lat., the subject of the present paper, and they are included in the latter group.

The perfect insect had long been known in our collections under the name of *Psylla spartii*, Hartig (Germ. Zeit., iii, 1841), until I, in my Monograph of the British species of *Psyllidæ*, published in the Trans. Ent. Soc. for 1876, changed it to that of *Arytæna ulicis*, Curt., B. E., 565, 22a (1835), his name having priority by some years. It stood thus until 1879, when Dr. Franz Löw recognised it as the *Psylla genistæ*, Latr., Hist. Crust. et Ins., p. 384 (1804), and so he named and described it in the Verh. z.-b. Ges. Wien, p. 596. At the end of the synonymy, he adds "*Die Jugendstadien sind noch unbekannt.*" This expression set me to work to try and discover the earlier stages of this, one of the commonest species we have in England, or, perhaps, I may say, on the Continent. For several days, at the end of August

and beginning of the present month, I beat a large quantity of furze (*Ulex europæus*) and broom (*Sarothamnus scoparius*), without any result, and I had almost despaired of obtaining the young, although the perfect insect was in swarms, until at last I observed one or two little creatures emerge from amongst some broom-leaves which I had beaten into an inverted umbrella. They appeared to be the object of my search, so I cut a few twigs of broom and put them and the insects together in my collecting bottle. On arriving at home, I turned them out into one of my breeding pots, and, in about a couple of days I had the satisfaction of seeing the first bred specimen of *Arytæna genistæ*. The pellets of excrement which they emit are large, milky-white, somewhat oval bodies, and are sometimes, I believe, joined together by a fine thread, or, perhaps, tube.

NYMPH.—Yellowish-green. *Head* broad, flattish, convex in front, with a few stout, long, black hairs in front. *Crown* dark brown, divided down the centre by a yellowish-green streak, widest next the base. *Eyes* large, pink. *Antennæ*: four basal joints yellowish-green, remainder black. *Thorax* yellowish-green, with two short, longitudinal black streaks on each side next the elytra-lobes, and five pairs of black foveæ placed more internally. *Elytra-lobes* brown, outer margin with about nine stout black hairs pointing somewhat anteriorly; disc with a few semi-erect black hairs running longitudinally. *Legs* yellowish-green, or sometimes brownish. *Tibia* with a row of stout black hairs down the anterior margin. *Tarsi* black. *Abdomen* above yellowish-green, lower half brown, darkest next the margin; two basal segments with a black streak on each side in the incision; margin with a long, stout, black hair at the base of each segment, disc very sparingly clothed with black hairs; underneath yellowish-green, or sometimes of a pink colour in the centre, with two pairs of rectangular black patches; margins of the segments yellowish-brown.

Burnt Ash Hill, Lee:

September 18th, 1880.

Orygia antiqua.—In the last No. of the Magazine I noticed a question by Mr. J. W. Douglas (p. 114), respecting the enforced celibacy of *Orygia antiqua* ♂, from which it appears that he only allows one male to each female developed; this is without question what the study of other *Lepidoptera* would lead one to believe in, but in the case of the "Vapourer" there are lamentable exceptions to the general rule.

Some years ago I bred a number of specimens of this moth, carefully separating the sexes in the larva condition (which is easily done, owing to the different colour of the dorsal tufts); one of the females which I reared attracted no less than seven males in succession, all of which she mated with; finally she expired without laying a single egg.—ARTHUR G. BUTLER, 10, Avington Grove, Penge, Surrey: October 2nd, 1880.

[Monogamy is believed to be the general rule with insects, although there are individual instances to the contrary. Mr. Butler's experiment shows what may happen under the abnormal conditions of the breeding-cage, and it is pos-

sible that similar results may occur where there is an excess of males in a state of freedom. Such an excess may exist sometimes, for Nature is prodigal of means to accomplish certainty in result; but the result of the perpetuation of a race would be defeated if such excess of males were not exceptional, if we may judge by the negative consequence of the polyandrous incident under notice. The subject is curious and worthy of wide experiment and observation, not only in this but other species of *Lepidoptera*, and also in species of other Orders. Polygamy in insects might also be a subject of research.—J. W. D.]

Vanessa Antiopa at Guildford.—One of these butterflies flew against my hat at noon yesterday, in the most fashionable part of Spital Street. It was as black as a coal with *white* fringe to its wings; was very quick in its movements and was over the chimney-pots in a twinkling.—A. H. SWINTON, Binfield House, Guildford: *September 2nd*, 1880.

Catocala fraxini near Lewes.—I had the pleasure of taking this fine insect on sugar near this town on 27th September last. The specimen is in fair condition, but had evidently been some time on the wing.—J. H. A. JENNER, 4, East Street, Lewes: *October 19th*, 1880.

Tapinostola Bondi at Lyme Regis.—Although probably most Lepidopterists are aware that *T. Bondi* is to be found in the neighbourhood of Lyme Regis, I do not think the occurrence of this species in Devonshire has been noticed in this Magazine. As the species is so extremely local, not only in this country but on the continent of Europe, it may be as well to record the fact of my finding it in abundance, in the beginning of July last, on the rough broken ground forming the slopes of the cliffs immediately to the west of the cement works at Lyme Regis, well into Devonshire.

It may be worth noting, that of the only two localities in this country from which this species has yet been obtained, one is in the south-east of Devon, and the other in the south-east of Kent.—H. Goss, Gloucester: *October*, 1880.

[We think *T. Bondi* was first discovered at Lyme Regis by Mr. Wormald, as noticed in the "Zoologist," vol. xxi, p. 8861; it ought surely to occur elsewhere on the south coast between that place and Folkestone.—EDS.]

Xylina furcifera (conformis) bred.—Like my friend Mr. W. H. Tugwell, I have been tolerably successful in breeding the above. From ten eggs that hatched at the beginning of May, I succeeded in getting eight larvæ to pupate by the middle of July (the larvæ grew very slowly during the first month and then fed up rapidly). The first moth appeared the 17th of September and the last this evening, October 4th. Eight very fine examples.—WILLIAM H. GRIGG, 51, Redland Road, Bristol: *October 4th*, 1880.

Polia nigrocincta at sugar, in South Wales.—During the second week of September, while collecting in the South of Pembrokeshire, I took a specimen (♂) of *Polia nigrocincta* at sugar, in the middle of a small wood. It passed as *P. flavocincta* until compared with specimens of this moth, and its identity has since been confirmed by Mr. Barrett. The only previous record I can find of *P. nigrocincta* having been found in the perfect state is the report by Mr. Hopley (in E. M. M.,

November, 1867), of a specimen having been taken off the window of a lighthouse, near Padstow, in August, 1862.—G. J. HEARDER, Job's Well, Carmarthen: 30th September, 1880.

Micra ostrina at Dover.—On September 8th, I was fortunate enough to take a fine specimen of *M. ostrina* on Dover Cliffs. I was nearly passing it over as a *Crambus*, which it much resembles in its flight. I took it about eleven o'clock during bright sunshine.

My capture confirms an old note I owe to Mr. Bond, that this insect is double-brooded: though I understood from the Rev. Hy. Burney that nearly all the captures known have occurred in June or July.—BATTERSHELL GILL, Folkestone: September 23rd, 1880.

Capture of *Micra ostrina*, *M. parva*, and *Noctua flammatrix*.—I have just added to my collection *M. ostrina* taken by a friend on the Dorset coast, and *M. parva* and *N. flammatrix* taken at Freshwater by Mr. H. Rogers in July and August.—C. W. DALE, Glanvilles Wootton: October 5th, 1880.

Notes on the young larva of *Triphæna pronuba*.—On the 5th of August last, some Lepidopterous eggs were sent to me for determination; they were on a stem of *Polygonum aviculare*, pearly-white, circular, with upper surface raised to a slight point. There was something in the look of them which seemed familiar to me and that it was some polyphagous animal was shown by my finding a batch of them on the flowers of *Lolium perenne*, on the 8th of August, yet I felt unable to guess at what they could be. However, as the pearly-white look was soon gone, and the eggs become duller and greyer, I felt I had not long to wait, and in due course there emerged some bristly, half-looping little larvæ, which I readily recognised as those of *Plusia gamma*.

I was accordingly not a little surprised when my querist informed me he had ascertained that the eggs he had sent me for determination were those of *Triphæna pronuba*, a larva which is well known to have 16 legs, and with which most Lepidopterists are tolerably familiar.

On the 15th of August, I was rather startled to find a sprig of *Cryptomeria japonica* quite covered with these same eggs, and that same evening I found another batch on a dead lilac stem. As I was not disposed at once to abandon my *P. gamma* notion, I resolved to ascertain to a dead certainty what these eggs really were, and so sent a supply at once to Mr. Buckler, who, from his great experience in rearing from the egg, was tolerably safe to succeed where I should have probably failed.

On the 10th of September, I received from him the following notes, showing that the eggs were unquestionably those of *Triphæna pronuba*, but that the larvæ when newly hatched have the two anterior pair of ventral prolegs ill-developed and do not use them when walking, thus causing their motions to resemble those of the genus *Plusia*.

"Eggs laid on *Cryptomeria* (received August 17th), close together, showing only the domed top of each, the ribs meeting in the centre, colour pinkish-grey (with dark blotch in the centre), increasing to almost leaden-grey; they hatched during the afternoon of the 19th August.

"The young larva resents in a testy way with some degree of pugnacity the being touched by a neighbouring larva, even while crawling away from the egg-shell. It is of a light grey colour, very pellucid, with blackish-brown head-plate, minute dots

and bristly hairs : by the third day after hatching the black acquires more colour of rather greenish-grey, the belly still translucent ; the first two pairs of ventral legs are at first not in use and but little developed, and the larva often rests in a looping position and walks like a semi-looper. They readily feed on plantain, dock, and grass.

"After their *first moult*, on the 26th, when they were a week old, their bodies were of a drab-green, with the head and plate light brown, altogether less translucent, and with dark brown hairs as before, still looping without using the less developed first two pairs of ventral legs.

"By the 31st they had *moulted a second time* and now showed a pale spiracular stripe and the belly rather translucent, above on back and sides green with paler dorsal and subdorsal lines, head pale. Length $\frac{1}{4}$ inch, by September 3rd fully $\frac{3}{8}$ inch long with the green of the back more opaque, the pale lines edged with darker, especially above the pale spiracular stripe. Only a few of the larvæ at this date answer to this description, as many have yet to get over this moult.

"September 5th ; 15 had *moulted the third time*, and were now possessed with all the characteristic markings of *Triphæna pronuba*.

"September 9th ; a few had just *moulted the fourth time*, others waiting to moult."

Mr. Buckler kindly sent me with these notes one larva in the third moult and one in the fourth moult. These larvæ had now ceased to loop and used all their 16 legs in walking as a sensible larva of *T. pronuba* should do.

Having felt a lively interest in these larvæ from their semi-looping habit in infancy, I put the question to Mr. Buckler whether he was acquainted with any other newly hatched 16-legged larva, which were also given to semi-looping ?

His reply to this query is of extreme interest :—

"In reply to your enquiry I can say that the larvæ of *Taniocampa opima* when young are semi-loopers, from not using the first two pairs of ventral legs, so also are the larvæ of *Phlogophora meticulosa* and no doubt those of many other species, but these are the latest instances I have observed."—H. T. STAINTON, Mountsfield, Lewisham : *September 15th*, 1880.

Notes on Lepidoptera in Yorkshire in 1880.—At the end of the season it is natural and necessary to put our notes and captures together, so that we may see how we stand in relation to the science we take an interest in, and note whether we have anything worth recording. It is an observed fact that there is great variation in the appearance of insects. Species common to one year are scarce the next, whilst others, which have been scarce for a year or more, again appear in great numbers ; how to account for this irregularity seems in the present state of our knowledge scarcely possible : we should reasonably expect from an abundance of one season an increase in the next, and so on, but we find the reverse of this the case, species one year plentiful, the following wanting or rare. Speaking to a gentleman the other day this subject came under our notice ; he suggested the idea that they were affected by atmospheric influence ; the egg or pupal stage required certain conditions of atmosphere to suit their existence and bring them forward, and without these were present they would remain in a dormant state for a limited or lengthened period.

The following insects have being noticed by me as been common in this locality

this season: *Smerinthus ocellatus* and *populi*, *Sesia bembeciformis*, *Odonestis potatoria*, *Odontopera bidentata*, *Phigalia pilosaria*, *Amphidasis betularia*, and vars. *Acidalia aversata*, *Notodonta dictæa* (larva), *Leucania pallens*, *Xylophasia lithoxylea*, *Apamea gemina*, *Noctua rubi*, *Plusia chrysitis*, *Mania typica*, and *Agrotis suffusa*. Whilst others usually seen have not been represented, viz.: *Eriogaster lanestris*, *Pygæra bucephala*, *Cerura furcula* and *bifida*, *Notodonta dromedaria*, *Mamestra anceps*, and *Hadena suasa*. Others again have been taken sparingly: *Polyommatus phlæas*, *Bombyx quercus*, *Ennomos erosaria*, *Acidalia immutata*, *Collix sparsata*, *Abraxas ulmata*, *Hypsipetes ruberata*, *Eupithecia pimpinellata* and *fraxinata*, *Acronycta tridens* and *leporina*, *Leucania conigera*, *Triphæna janthina*, *Polia chi*, *Plusia iota*, and *Habrostola triplasia*. I have also taken the following for the first time: *Euchelia jacobææ*, larva on Ragwort, *Aplecta occulta*, *Miana literosa*, *Orthosia suspecta* visited sugar, *Pyralis glaucinalis* in a spider's web, *Cryptoblabes bistriga* at rest on the trunk of an oak tree, *Gelechia ligulella*, *Swammerdamia cæsiella* captured on the wing, *Argyresthia Gædartaella*, *curvella* and *albistria* mothing, *Gracilaria Swederella* and *Elachista cerussella*, the latter I found flying over reeds and long grass in a boggy place, *Cerostoma scabrella* taken at rest on a hawthorn hedge, *Laverna epilobiella*, bred six specimens from larva taken on *Epilobium hirsutum*. Also several other species which are as yet undetermined.

Nepticula argyropeza taken as larva last year; I reared five imagos. *Coleophora currucipennella*, this species I incorrectly named in my last communication; having opportunity of showing it to Mr. Sang of Darlington, he referred it to *C. ardeæpennella* of Scott, remarking that the cases of this species and *ibipennella* were similar in form, but that the former stood upright on the leaf while the latter was nearly prostrate; having taken both species I can speak to the same effect. I may mention also that *Trichiura cratægi* and *Triphæna fimbria* have been taken in this locality, the first as larva the second at sugar.

I also had the pleasure of visiting Edlington Wood, near Doncaster, when I succeeded in obtaining a fine series of *Scoparia basistrigalis* and *Olindia ulmana*, also larva of *Pæcilocampa populi* and *Hyponomeuta plumbella*, from the latter I have now a nice set.

On the 17th of this month, a fair specimen of *Vanessa Antiopa* was captured in a garden at Holgate, by Mr. Skilbeck, and given to me; it is larger than usual, measuring 3 inches 1 line in expanse of wing. On the 20th, I took *Agrotis saucia* and *Anchocelis rufina* at sugar, neither of which is common in this neighbourhood. On the 27th, a second specimen of *Vanessa Antiopa* was seen by myself in the nurseries here; it flew over some trees and settled down about six yards before me; I tried to get my hat over it but failed.—T. WILSON, Holgate, York: October, 1880.

Captures of Lepidoptera in the vicinity of London.—A short account of the insects I have taken in the vicinity of London this season may be of interest to some of your readers. Early in April *Micropteryx purpurella* and *semipurpurella* were common near Plumstead, and *M. unimaculella* on Wimbledon Common. In Headly Lane during the season I have beaten from Juniper *Zelleria insignipennella*, *Argyresthia præcocella*, *arceuthina*, *dilectella*, *aurulentella*, and *abdominalis*, the last being much the rarest: on August 31st, *G. semifascia* was common among the junipers in the neighbourhood of maples. Hampstead Heath produced *Coleophora*

albicostella in plenty, and *Lampronia luzella*: *Lithocolletis scopariella*, *Elachista subobscura*, and *Trifurcula immundella* also turned up there, and at Barnes and Wanstead; and on oak trunks at this latter place I took a good series of *Laverna Stephensii*; *Gelechia gerronella* seems to be common wherever the furze grows: *Gel. pinguinella* was scarce, but occurred in the old locality. In Regent's Park I took, as usual, in plenty, *Gel. notatella*, *Laverna vinolentella*, *Prays Curtisellus*, *Gel. luculella*, and *albiceps*, and a few *G. leucatella*. *C. vittella* swarmed both here and in Hyde Park, where I also succeeded in securing five or six dozen *Tinea caprimulgella*. This insect is very lazy, very local, and fond of dark corners: it may often be found hanging in cobwebs, where it remains perfectly still, apparently secure from the attacks of spiders. *Ecophora angustella*, which is generally dispersed, was somewhat common at Wandsworth.

From cocoons found in the cracks of oak trunks at Wanstead, I bred a good series of *Cerostoma alpella*, and from larvæ and pupæ on *Convolvulus* at Lewisham, the same of *Bedellia somnulentella*. Other *Tineæ*, of which I obtained a few, were *Gel. velocella* at Barnes, *Gel. distinctella* at Sanderstead, *El. Gleichenella*, *Bedellia* and *stabilella*, *Pancalia Latreillella*, and *Stephensia Brunnichella* at Boxhill, *Argyresthia mendica*, *curvella*, and *pygmælla* at Pinner. The larvæ of *Cosmopteryx Drurella* occurred in profusion near Weybridge, and I now have a few small cases of *Nemotois Schiffermillerella* from flowers of *Ballota nigra* collected at Gravesend: so that as far as *Tineina* are concerned, I have no reason to be dissatisfied with the past season. In *Tortrices* I have done very little: *Dichrorampha sequana* common near Ladywell Station and a beautiful *Carpocapsa splendana* at Croydon being the only ones worth mentioning.

Feeding on flowers and seeds of hemlock in Headly Lane, I got eight larvæ of an *Eupithecia* (of which seven were ichneumonised), green with a black head, of which I shall be glad to learn the name.—W. WARREN, Park House, Stubbington, Fareham, Hants: September 17th, 1880.

Pyroderces argyrogrammos bred.—My friend Baron von Nolcken spent last winter at Cannes and took home with him a number of pupæ of *Micro-Lepidoptera*. Many of the perfect insects emerged during his journey from the South of Europe to the coast of the Baltic, and were spoilt past recovery, but some fortunately continued in the pupa state till he was settled at home, and then, when they emerged, he was able to set out at his leisure in Russia, many of the little gems whose home was in more sunny regions. Among the insects that he bred rather freely was *Pyroderces argyrogrammos*.

This insect, first taken in Asia Minor by Professor Loew, and described in the *Isis* of 1847, by Zeller, who mentions that he had also met with it in Sicily and near Rome, has since been noticed in many parts of Southern Europe and occurs likewise in Hungary.

Till I heard from Baron von Nolcken that he had been breeding this insect, I was not aware that its transformations had been detected.

On writing to my friend for further details, he referred me to Millière's "Catalogue Raisonné des Lépidoptères des Alpes Maritimes," where at p. 359 he says of this insect "Mai, Cannes; terrains crétacés des lieux arides. Très-abondante sur les chardons à fleurs jaunes (*Carlina lanata*), dont les chenilles rongent les graines."

On this hint, Baron von Nolcken says that he collected in December, when at Cannes, a number of thistle-heads, without, however, knowing anything of the colour of the flowers, which were then long out of bloom—the result was that he bred, as already mentioned, a fine series of *Pyroderces argyrogrammos*.

Any Entomologist who has friends in the South of France, might utilize their stay there by getting them to send home a lot of thistle-heads during the winter months.—H. T. STAINTON, Mountsfield, Lewisham: *October 9th*, 1880.

Noctua c-nigrum in June.—I took five specimens of *Noctua c-nigrum* in June, and a friend two specimens. I did not look upon its occurrence at that date as singular till I saw a notice in the August No. of the Ent. Mo. Mag. by Mr. Douglas (*ante* p. 70) of a specimen having been taken on June 27th.

I took four of the specimens on hedge-row trees at sugar, three of the others were netted; four of them were in fine fresh condition, all of which I have set out; the others had a worn appearance.

Most of the species of *Lepidoptera* that I have had experience of here have appeared on the wing considerably earlier than usual; but I have one instance in marked contrast to note, that being the capture of a very good male specimen of *Saturnia carpini*, which I took in bright sunshine on the 24th of June last.—A. ELLIOT, Samieston, Jedburgh, N.B.: *September 15th*, 1880.

[*Noctua c-nigrum* also appeared at Pembroke in June. There seems reason to suspect that if the autumn be unfavourable, this species does not emerge at its usual time, but lies over in pupa until the succeeding June. This may also be the case with *Agrotis suffusa*, and even *saucia*.—C. G. B.]

The destructive effects of Anisoplia austriaca in Russia.—The British Vice-Consul at Nicolaieff in a recent report says, "One of the most destructive insects in South Russia is the beetle *Anisoplia austriaca*, called by the rural population of Kherson *Couzka*. This insect first appeared in 1865 in the Melitopol district, but there is nothing known as to how and whence it came, as it had never been heard of in any other part of Russia or bordering countries. The form of the insect is oblong and slightly convex; it is of the size of a grain of Ricinus-seed, and of a cinnamon colour. The change from egg to larva and from larva to a full-grown beetle takes nearly two years. The female lays her eggs about two inches deep in the earth, and the larvæ, after leaving the eggs, grow very slowly, live the whole winter in the earth, finding nourishment in the soil, and then become more developed, but remain as larvæ during the following summer and winter; then on the approach of spring they rise to the surface of the ground, where they accumulate. As many as ten bushels of the beetles have been collected from one acre of wheat. They fly from ear to ear and do not quit it until it is destroyed. They are capable of making long flights from one Government to another. Last summer a mass of these beetles was discovered in the sea near Ochakoff; they were so thick that it was difficult to pull a boat through them. They were gradually washed on shore, and the people, instead of taking prompt measures, allowed them to remain there. When at last they recognised the danger with which they were menaced, persons were sent with horses, casks, &c., to destroy them, but it was too late; about three-fourths had recovered strength and flown into the neighbourhood to form a new generation in

that district." The Vice-Consul adds, that unless efficient measures are adopted it is probable that all agricultural Russia will eventually become the prey of these insects, causing privations hitherto little known in the country. He considers that the subject demands the serious attention of Europe, as Russia supplies so many countries with wheat, and her misfortune may raise the price of American produce.

In his sixteenth Report on injurious insects (Journal of the Royal Agricultural Society of England, vol. xviii), Curtis says respecting the larvæ of the common *Anisoplia* (*Phyllopertha*) *horticola*, that they are often very destructive in pasture-land by consuming the roots of the grass, and that the best remedy is to water the grass in the autumn with a mixture of one-tenth of gas-liquor to nine-tenths of water, which will do no harm to the grass but will extirpate the larvæ. When gas-liquor cannot be obtained strong salt water may be used. In the spring, he says, land affected by these larvæ should be broken up, as at that time they are near the surface and become an acceptable treat to rooks, starlings, thrushes, blackbirds, robins, &c., and even sparrows have been known to gorge themselves with these larvæ so that they were unable to fly. The perfect beetles eat roses and flowers of hawthorn, and then feed on wheat and oats. But although generally common the insects are not excessively numerous every year, and so it may be with *A. austriaca* in Russia, and that the damage apprehended from it may be exaggerated. There is no fact relating to insects better known than that a species may be exceedingly abundant generally, in one year, and, contrary to expectation, be very scarce the next, or for several years afterwards.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: August 22nd, 1880.

P.S.—Since the foregoing was in type I am reminded that the ravages of *Anisoplia austriaca* in Russia formed the subject of a report by a Sub-Committee of the Entomological Society of London in 1878, which was drawn up for the use of Her Majesty's Consul at Taganrog, who, in a communication to the Foreign Office, had adverted to the immense damage done by these and other beetles to the grain crops in several provinces of Southern Russia. The report of the Sub-Committee (given at length in the Transactions of the Society for 1878 [Proceedings p. 57], and noticed in this Magazine, vol. xv, p. 212), after alluding to the appearance of enormous numbers of *A. austriaca* in the Banate, Hungary, in 1867—upwards of six millions of beetles being estimated to have been then destroyed by 100 men employed for the purpose—goes on to recommend as remedial measures the rotation of crops, and the preservation of insectivorous birds; and finally state that experience shows there is no reason to apprehend such a visitation every year.—J. W. D.

Notes on some scarce Coleoptera.—In the August number of this magazine, p. 69, *ante*, I recorded the capture of *Euplectus punctatus*, some years ago, in Sherwood Forest, by Mr. Matthews; on August 27th, I took this beetle myself under bark of a rotten tree in its old locality; I also got a specimen of *Micropeplus tesserula*, by sweeping at sunset. I had always supposed this to be a fen insect, but must have been mistaken.

Among some beetles sent to me to name by Mr. T. N. Hart-Smith, of Marlborough College, I found a specimen of *Hydroporus marginatus*: this is, I think, new locality, it seems to be found both near the coast and inland; it is probably often thrown away in mistake for *H. litura*, which it much resembles at first sight

it is, however, easily distinguished by its larger and wider shape, its differently coloured head, and thorax widely margined with yellow.—W. W. FOWLER, Lincoln : *October 15th*, 1880.

Two additions to the Dragon-flies of Switzerland.—In August of this year I spent ten days in the Engadine, making Pontresina my head-quarters. Being specially in quest of *Trichoptera* my attention was principally directed to them, and I hope hereafter to publish a list of the species captured, with notes on the excursions, &c. In the course of my wanderings I came upon the little "Statzer-See" (scarcely more than a large pond) between Pontresina and St. Moritz by the wood-path over the side of the mountain, and lying at an elevation of about 6200 feet. It is fed by springs and very small streams, is uncontaminated by snow or glacier water, and it has a wide fringe of very boggy ground (as I found to my cost). So it is essentially fitted for alpine Dragon-flies and other *Neuroptera*. I soon found it was the haunt of species of the genus *Cordulia*, and on three days from August 12th to 16th, 13 examples of this genus were secured, which proved to consist of 9 ♂ of *C. metallica*, 1 ♂ of *C. alpestris*, and 2 ♂, 1 ♀ of *C. arctica*, the latter being new to the Swiss Fauna. Large *Æschne* were not uncommon, but it was almost impossible to capture them. Only three individuals were taken, viz:—*Æ. juncea* ♂ ♀ and *Æ. borealis* ♀, the latter also new to Switzerland. In June, 1865, I had taken *C. arctica* and *Æ. borealis* at Rannoch in Scotland, thus it was like the renewal of old acquaintanceship; but the surroundings were very different. The other Dragon-flies were not important, and the season was already advanced. The larger Lake of St. Moritz, although not a mile away, and into which the "Statzer-See" discharges, did not furnish a single Dragon-fly, a fact only to be explained by the very different physical conditions of the two lakes.—R. McLACHLAN, Lewisham : *September 30th*, 1880.

Chrysopa pallida in Switzerland.—Towards the end of August, I was a few days at Thusis, in the vicinity of the celebrated gorge known as the Via Mala. Five examples of the fine large *C. pallida* were secured by beating spruce firs, a species altogether new to this part of Europe. Others were seen, and it is probably rather common; but a series of small storms rendered beating chiefly productive of drenchings.—ID.

Extreme abundance of Cæcilius pedicularius.—Will you kindly tell me the name of the enclosed insects?

I take the liberty of applying to you because I suppose them to be *Psocidæ*. I know next to nothing of this family, and have not time to work it up, but I like to obtain an insight into any branch of Natural History that forces itself upon me. And this these little flies have done, for they abounded in my corn-fields and were a source of great annoyance to the harvesters by settling and crawling upon their arms and faces. Subsequently, on hot days, they have been on the wing in incredible numbers.

Am I right in supposing them to feed on fungoid growths?, if so, the mildew would account for their presence on the corn.—THOS. H. HART, Kingsnorth, Ashford, Kent : *October 9th*, 1880.

[The insects are *Cæcilius pedicularius*, L., the smallest European species of

winged *Psocidæ*, ordinarily very common in autumn, especially in houses. Mr. Hart is no doubt correct in supposing they feed upon mildew; probably they also attack ordinary dust and *débris*, such as that which collects in corners anywhere.—R. McLACHLAN.]

The red clover and hive bees.—"The bee has been forbidden the honey of the red clover, as a punishment for not keeping Sunday"—an interesting item of popular Natural History among the peasantry of Mecklenburg, which I find recorded in the recent work of Prof. C. Bartsch, "Sagen, &c., aus Mecklenburg."

This belief probably rests on the observed fact that the proboscis of the bee is too short to reach down to the honey of the red clover; nevertheless, they get at it by gnawing a hole through the side of the florets. (See Herman Müller, *Befruchtung d. Blumen durch Insecten*, 1873, p. 224).—C. R. OSTEN-SACKEN, Heidelberg: October, 1880.

A swarm of flies.—Under this heading the "Shipping and Mercantile Gazette," of September 8th, has the following account:—

"The Master of the schooner 'Topsy' informs us that at 10 a.m., on Thursday, the 2nd inst., while on a passage from Grimsby to London, the 'Topsy' became swarmed with flies, so thick were they that the people on board were unable to remain on deck for five hours; there were millions upon millions of flies. The air became clear about 4 p.m., when the flies were thrown overboard by shovels-full, and the remainder were washed off the decks by buckets of water and brooms."

I have seen the Master of the "Topsy" and he informs me that there is not the least exaggeration in this statement; and that although he has been in many parts of the world he never witnessed such a scene before. The vessel, at the time, was sailing along the Norfolk coast, about a cable's length from the shore; the air was obscured by the flies, as by a cloud, and they fell as thickly as snow-flakes, closely covering the rigging as well as the deck. He gave me some of the flies which I forwarded to Mr. R. H. Meade of Bradford, who has obligingly sent the following note respecting them:—

"The little flies are *all females* of *Dilophus vulgaris* (*spinatus*, Wlk.), one of the *Bibionidæ* (*Nemocera*). This common little fly ("in profusion everywhere, most so on sand-hills," Hal.*) sometimes appears in immense numbers or masses, in which the members of one sex usually greatly predominate over those of the other. Some of the species of *Bibio*, to which *Dilophus* is closely allied, have the same habit; very little is known of their life-history. The larvæ of the species of *Bibio* are said to feed at the roots of grass, and Zetterstedt says that he has found the larvæ and pupæ of *Dilophus vulgaris* in the stems of grass.

"The occurrence of this cloud of flies at sea is very curious and interesting. Were these females seeking some fresh pasture in which to deposit their eggs?"—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: September 15th, 1880.

Reviews.

THE TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION: Parts i—iii. London: W. Satchell & Co.; Leeds: Taylor Bros. 1878—80, 8vo.

Most of our readers are familiar with the "Naturalist," the monthly journal of the above-mentioned "Union." Latterly the body has also issued a more pretentious publication in the form of "Transactions," three parts of which are before us.

Naturally they include all branches of Natural History ; but the subjects are divided into Sections, and each of these is paged separately. The aim appears to be twofold in its nature : firstly, to furnish local lists, and, secondly, to chronicle notable additions of novelties and rarities noticed in each year. Insects evidently occupy a large share of the attention of the Members of these Societies, and amongst the contributors we notice the names of Porritt and Prest for *Lepidoptera*, Mosley for *Hemiptera* and *Diptera*, and W. D. Roebuck and Bairstow for *Hymenoptera*. But Ornithology, Conchology, and Botany are equally as well represented. The paper, typography, and general "getting-up" are excellent.

The existence of such a multitude of Natural History Societies in a small district (for so Yorkshire is, notwithstanding it is our largest county), is probably an almost unique fact, and we believe we are correct in stating that the majority of the Members are of the artisan class. Judging from the List of Members on the cover of Part iii, half-a-crown is the usual annual subscription, but it appears to be optional with Members to supply pecuniary aid in excess of this modest sum, an option largely exercised, even to the extent of two guineas. Those amongst "Britishers" who know the tastes of some of the better class amongst our artisans in the great industrial centres (of which Yorkshire is one), will be little surprised at finding Naturalists so abundant amongst them : to foreigners the fact must be a matter for some little astonishment. It was a happy idea to unite these Societies under a central governing body, and this latter, if wise, should use its position for educational purposes on broad principles, by impressing upon the Members the necessity of recognising the fact that Yorkshire is not Britain, and that Britain is only an island in the northern seas.

INSECT VARIETY : ITS PROPAGATION AND DISTRIBUTION, TREATING OF THE ODOURS, DANCES, COLOURS, AND MUSIC IN ALL GRASSHOPPERS, CICADÆ, AND MOTHS ; BEETLES, LEAF-INSECTS, BEES, AND BUTTERFLIES ; BUGS, FLIES, AND EPHEMERÆ ; AND EXHIBITING THE BEARING OF THE SCIENCE OF ENTOMOLOGY ON GEOLOGY. By A. H. SWINTON. London : Cassell, Petter, Galpin & Co., 1880, pp. 326, 8vo.

This work indicates extensive reading of the writings, in many languages, of authors, ancient and modern, who have investigated the attributes of insect-life, and copious extracts and references are given, together with statements of the researches and observations of the author himself, some of which have appeared in this magazine ; the illustrations consist of a frontispiece, seven mostly well-drawn plates, and figures incorporated with the text. The odours, dances, colours, and music (erroneously so-called) of insects have always been deemed to be manifestations of love, fear, anger, or rivalry, and as ministering directly or indirectly to the maintenance of their race ; but when it is said or inferred that they are also the primary or remote causes of insect-variety, we demur, and say that the statement or inference is not proved. It is admitted, even by the author, that sounds emitted by an insect are attractive only to others of the same species, although there are, as stated, some exceptions in the *Cicadæ*. Variety, that is, differentiation of species, and even the variation of the individuals of a species, are really due to extrinsic changing, or for a time persistent, conditions and agencies acting on elastic vital powers. Nevertheless, as bringing a great number of observations of numerous investigators into one view, this work is very interesting and serviceable, but it sadly wants an index for reference to special items.

The use of the vulgar English names of insects (and the book is full of them), at any rate without the scientific ones, is a mistake; such names, given in the old time by mere collectors, served *their* purpose of distinguishing the insects they obtained, so far as their own collections were concerned, but had no basis of scientific arrangement. They are, therefore, of no service now, either with or without the scientific names, and although attempts have been made to retain them by some who should have known better, they are deservedly falling into disuse. If our author hopes to have his book read out of Britain, what can a foreigner understand by "Bath White," "Queen of Spain," "Dark Arches," "Tawny-barred Angle," &c.

The literary composition is very curious. Thus, we find such terms as "symbol of war," "brown horror of autumn," "ambient ether," "sun-god," "domain of Flora," &c.—all inappropriate in a work of scientific character. The style of the writing is ambitious, but the long, involved sentences, despite the surplus of sensational adjectives, are often obscure, to say the least. Thus, at page 60, we read, "We have shown that the *battle* of males for the female, that burns so fiercely in higher organizations, which gave antlers to the stag, horns to the bull, spurs to the cock, and incisive weapons to the fish, smoulders yet more intensely in mandibulate insects of the *Orthoptera*, *Coleoptera*, *Hymenoptera*, and *Neuroptera*, many of whom bite and devour one another." At page 86,—"If we consult a cabinet as regards terrestrial climate, we shall find that the rays of the sun impart a richness of tint, varying with the ardour of his beams, and that tropical species, which are diurnal, have a gaudiness compatible with the languor of a clime that becomes their guardian, expressed in the opaque, paint-like pigment that imparts a varnish to their dermal tints, with a heaviness to their external coverings." Other similar *delicia* await the reader—these he must find for himself; the climax of rhapsody is, perhaps, reached at page 169, thus:—"In the existing rage for cheap music, when flashing lights, impassioned notes, and sweet warblings greet the man of business homeward wending, and drive far into the sorrows of the night, it is scarcely to be wondered, refrains so full of small peaceful harmonies as those complaining notes (of grasshoppers), that each autumn echo beneath the blithe ring of the mowers, should continue a study for the poet and musician. And it is thus we not only hear of them blending in the luxuriant tide of song on Transatlantic pianos, but what is more generally feasible, find them adapted to rhythmic notations by admiring frequenters of the green banks of the Rhine and Alpine glaciers, where they possibly lend much to the charms of the scenery. * * * Nor are the pastorals of our insular troubadours to be despised. How often do the young in years, who listlessly recline in zephyry hay-fields, take lovers' walks or meditative strolls, receive brisk overtures, which haunt the mind and whisper back the cheerful voices of seasons that have flown!"

On the other hand, we have expressions of wonderful *naïveté*. Thus, at page 39, we read:—"An example of the Privet Hawk Moth I had killed in the usual manner, and had assumed to be dead;" and, at page 295: "In the large voracious Wart Biter, a parrot-like transition (of colour) after emergence serves to develop an invisible pattern of brown spots, which renders the individuals to human optics considerably more conspicuous and suited to recognise and reproduce their kind."

The printing is clear, but there are several typographical errors, such as "accept" for "except," "blue-fly" for "blow-fly," "*Leucanidæ*" for "*Lucanidæ*," &c. Often names of insects are in Roman instead of Italic type; and such eccentricities occur as, for instance, "*aphrodite*" with a small initial letter, and "*Brassicæ*" with a large one; for all which blemishes we trust some one besides the author is accountable.

EUCALYPTUS GALLS.

BY R. McLACHLAN, F.R.S., &c.

I am indebted to Dr. M. T. Masters, F.R.S., editor of the *Gardeners' Chronicle*, for the opportunity of describing and figuring two most remarkable forms of Galls on *Eucalypti* from Australia.

The singular mass of galls, of which a *slightly enlarged* figure is given below, was sent from the Phytologic Museum of Melbourne,



Australia, to Dr. Masters, by Baron Ferdinand von Mueller. These galls were found by Mr. Tepper on *Eucalyptus gracilis* at Spencer's Gulf, South Australia. The branched twig before me (only a portion of which is figured) bears several hundred galls, thickly clustered, and

their position is such as to induce a belief that each gall is a modified flower-bud. In a dried state the galls are reddish-grey in colour. They are of a long spindle-shape, slightly curved, with the apex much produced, the outer surface slightly rugose, and with faint longitudinal ribs. The length of the individual galls varies from 6 to 13 lines, and the average diameter is about $1\frac{1}{3}$ line. When broken they are seen to be quite hollow, with only thin walls, and they emit a pleasant



aromatic resinous odour, similar to that of rosemary. Many of them have a small circular opening (see the enlarged figures) a considerable distance below the apex, whence an insect has escaped.

I have broken open many galls from which an insect had not escaped. In some of these I find the shrivelled-up remains of a larva (never more than one in a gall) that appears to be dipterous, and no doubt the true gall-maker, but in the majority there is the dried-up pupa of a Hymenopterous parasite with clavate antennæ, apparently belonging to the group *Pteromalini* of the *Chalcididae*. In all those galls from which the insect has emerged, I find only the puparium of this parasite. I have not sacrificed every unperforated gall, but those

examined have not presented Dipterous pupæ, nor the remains of any Dipterous insect ready to emerge. We are thus left somewhat in the dark as to the real nature of the gall-maker, and it is very desirable that specimens of the galls in alcohol be examined.

The second figure (p. 146) represents galls on a species of *Eucalyptus* also forwarded by Baron Ferdinand von Mueller, *much reduced in size*. At first sight each gall reminds one of a distorted fruit or capsule, but Dr. Masters is of opinion that (from their position) they are not modified buds either of leaf or flower. On the twig before me the galls are placed unilaterally, with the exception of the lowest of the series. Each gall (dried) is somewhat olivaceous in colour (as the leaves). Each measures about 10 lines in length, and about 5 in diameter. Each has four strong angular keels externally, which are continued into extraordinary processes about $2\frac{1}{2}$ inches long, and slightly curved at the tips; occasionally one of these processes is aborted or abbreviated, and in one instance a tendency to furcate is shown. They are extremely hard, and the walls are quite a line in thickness, and when cut, a very strong odour, like that of intensified black currant, is very evident.

Fortunately in this instance it is possible to fix with certainty the Order to which the gall-maker belongs. Baron von Mueller extracted larvæ from some similar galls, and forwarded them in fluid. They are Lepidopterous. A well-grown larva is about an inch in length, pinky-whitish in colour, somewhat semi-transparent,



$\frac{1}{4}$ and without markings, save that there are black dots on the spiracular region, independent of the black spiracles themselves; the head is pale castaneous. There are eight ventral (in addition to the anal) prolegs. Judging from the general aspect of the larvæ I am inclined to refer them to the *Pyralidæ*, but their exact position must remain doubtful. In those galls opened by me I find the interior entirely occupied by what appears to be an imperfectly developed chrysalis of the moth, covered with a whitish powdery substance, and greatly distended. Each chrysalis is crammed with the fully developed pupæ of a Hymenopterous parasite of the family *Chalcididæ*. In no case is there any orifice through which a moth could have escaped, but in the middle of the apex, between the four horns, there is a very small opening, scarcely sufficient to admit a small pin, which I take to be natural, and serving to supply air, which it would be impossible to obtain through the thick hard walls of the galls, and not made by the parasites, though it might afterwards be enlarged to admit of the escape of either moth or parasite. The tail-end of the chrysalis is extremely pointed, and placed towards this minute orifice.

EREBIA CASSIOPE AT HOME.

BY JANE FRASER.

Of the four localities in Perthshire where I have met with *Erebia Cassiope*, three are on the northern slope of mountains, and thus peculiarly exposed to cold wind. During last summer (1880) I observed *Cassiope* on the wing for the first time on June 16th, the day was bright and sunny, with a strong wind from the east, only a very few of the insects (all males) were to be seen, and all had that velvety appearance which betokens recent emergence. On June 25th, it was out in great abundance, and on July 1st, still appeared in large numbers, and though some of them were worn and tattered, many of both sexes appeared to be freshly out.

Among the Perthshire hills there is one, which, though only between 2000 and 3000 feet high, is rather famous as a place where strangers not well up in the geography of the surroundings, are apt to lose their way, and have been known to wander as far as a shepherd's hut in a neighbouring glen, several miles in an opposite direction from the glen they started from in the morning. It is certainly one of the wildest, rockiest bits of hill ground in Perthshire, at the base pretty well wooded with birch, fir, hazel, and alder, and there is one secluded spot where, underneath the hazels, the rare *Scopula decrepitalis* has its home. From half-way up the mountain to the summit there are innumerable high ridges of rock, and between these ridges there are rills of clear sparkling water foaming and tumbling over rocks and stones, sometimes forming still pools which reflect the heather-clad banks, and here and there huge masses of rock are lying, which must at some times gone by have rolled down from the mountain top, but now are overgrown with heather, blueberry, and crowberry. These huge detached masses form favourite resting places for the Peregrine Falcon, and more than once I have got a glimpse of this grand-looking bird perched in such spots, and as traces of the fur of the mountain hare and feathers and bones of birds may be observed sometimes on the tops of those rocks, it would seem to be a habit of the Peregrine to convey his food there.

On July 1st, we ascended this hill from the north, its steepest and most rocky side. The morning had been cold and misty, but the clouds gradually "lifted," and at last the sun sent forth a blaze of heat, and immense numbers of insects appeared on the wing. From the sheltered side of nearly every rock *Larentia cæsiata* rose in crowds at our approach, some of them with the dark bar on the forewing very black and strongly marked, and, wherever there was a bit

level peat bog, *Cænonympha Davus* was to be seen, its tawny wings harmonizing with the quiet tone of the surroundings. At an elevation of about 1000 feet, on either side of a picturesque burn which was shut in on both sides by rocky banks, we found *Erebia Cassiope*, at first sparingly, but as we advanced a little higher it increased in numbers, and at 2000 feet was abundant. It was seen in greatest numbers in the ravines formed by those small mountain rills where tufty grass grew, but was to be seen also flying over, alighting on, and at rest (when out of the sun) on the heather. During the afternoon and while the sun was bright they were very active on the wing, and sometimes took pretty long flights, but always flew low, seldom rising more than four feet above the ground, and when a slight passing cloud overcast the sun for a few minutes, they did as *Erebia Blandina* so often does under the same conditions—dropped in among the grass and lay with folded wings close to the roots, looking like old withered leaves. There was one sheltered place beside a small waterfall where mountain thyme and a little yellow starlike flower grew in abundance, and it was charming to see them resting on the flowers with expanded wings, the dark red spots looking brighter in the sunshine than they do in the cabinet. At a height of about 1000 feet *Larentia cæsiata* ceased to appear, and was succeeded by *Mixodia Schulziana*, *Scopula alpinalis*, *Amphisa Gerningana*, and *Tortrix viburnana*, all these on this hill ascending to 2000 ft. A little above this altitude the dense cloud which had overshadowed us in the morning, still shrouded the hill top, and rendered the air too chill and damp for butterflies and moths. And a strange experience it was to be so near this thick mist; while standing in the sunshine about 100 feet below it, the distance so clear that the blue peaks of far-away Jura and Mull were visible. An occasional drift of chill misty air blowing past, warned us that it was unwise to remain so near the cloud, and getting over the shoulder of the mountain we began to descend the southern slope, keeping in the gorge of a water course. A little below 2000 feet *Erebia Cassiope* again appeared, in some sheltered spots, literally swarming, and altogether in fresher condition than those on the north side of the mountain.

It was pretty early when we started in the morning, but I was so charmed with the sight of this pretty Alpine butterfly, that I lingered among them until the sun went down behind a higher mountain, and then the *Cassiope* betook themselves to their night's quarters. A very few simply closed their wings, and hung like little withered leaves from grasses, but the majority dropped in among the heather and clung to the stems a little above the ground with their wings drooping downwards.

AN ADDITIONAL SPECIES OF BRITISH *HEMIPTERA*.

BY JAMES EDWARDS.

On the 18th October last, I took off a spruce-fir at Stratton Strawless, near Norwich, a few examples of a *Lygus*, which Mr. Douglas has determined to be a species not hitherto recorded as British. The characters given below will suffice to distinguish it from all the British species of the genus; it comes next to *L. rubricatus*, Fall.

LYGUS ATOMARIUS.

Capsus atomarius, Meyer, Schw. Rhynch., 73, 46, tab. 4, fig. 3 (1843).

Hadrodema atomaria, Fieb., Eur. Hem., 277, 1 (1861).

Lygus atomarius, id., 392, 3.*

Long-oval. Above testaceous, more or less tinged with red, closely punctured, and covered with fine pale pubescence; sometimes more or less irrorated with black, or with a black stripe on each elytron.† Head in ♂ black, in ♀ pale with three black spots, the middle one V-shaped; *cuneus* orange, the inner angle with a small black spot; *membrane* irrorated. *Scutellum* generally with a dark central stripe. Intermediate and posterior *thighs* with two dark ante-apical rings; posterior *tibiae* outwardly with fine, short, black spines; last joint of the *tarsi* black, except at the base. *Antennae* dingy yellowish, the 3rd and 4th joints, and more or less of the apical portion of the 2nd, black. Length, 2—2½ lines.

The variations in marking seem to be confined to the males.

Bracondale, Norwich:

5th November, 1880.

ON THE EGGS AND LARVÆ OF SOME *CHRYSOMELÆ* AND OTHER (ALLIED) SPECIES OF *PHYTOPHAGA*.

BY J. A. OSBORNE, M.D.

In the synthetic arrangement of larvæ attempted by McLeay and extended by Kirby and Spence, the Coleopterous larvæ are divided into five tribes by McLeay, one of which is—

“4. *A hexapod and distinctly antenniferous larva, with a sub-ovate rather conical body, of which the second segment is longer and of a different form from the others, so as to give the appearance of a thorax.*

* Fieber gives as a synonym *Capsus delicatus*, Mulsant (*rectè* Perris), Ann. Soc. Linn. Lyon, 1857, p. 167, but the description in no way accords with *L. atomarius*, and Reuter refers the species, as distinct, to the genus *Amblytylus* (Hem. Gymn. Eur. ii, 210).—Eds.

† Meyer's description and figure, made from a single example, show the pronotum and elytra covered with scattered pitchy-black atoms. Fieber, however, remarks that a fully-spotted individual is represented, that such marking is exceptional, and even on the membrane is sometimes obsolete. Frey-Gessner Mitth. schw. ent. Ges., ii, 23, says also that Meyer's type-form rarely occurs, and he had ample means of knowing, for he adds that in Switzerland, although the species is scarce, yet at times, in the place where it is found, it is numerous on “*Rothtannen*” (*Abies picea*) in April and September. It is also found in Bohemia and France on other conifers.—Eds.

His denomination for these is *Anopluriform*, from *Pediculus*, L., forming Dr. Leach's *Anoplura*. His examples are *Coccinella* and *Chrysomela*, L." K. & S., vol. iii, p. 160.

The general description may apply; but that striking, if superficial, resemblance to *Pediculus*, which suggested the denomination, does not extend to all the species included in the Linnean, nor perhaps to any of the restricted, genus, *Chrysomela*. In giving their own definition of the Anopluriform type (*loc. cit.* p. 162), K. & S. exclude *Chrysomela* altogether in restricting its application to *carnivorous* larvæ; but, leaving out this word, the rest of the description—"hexapod; antenniferous; with a shortish oblong depressed body, and distinct thoracic shield,"—seems to apply very well to a section of the Linnean genus, *e. g.*, *Lina*, *Gastrophysa*, *Prasocuris*; and to be equally unsuitable to others, as *Timarcha* and *Chrysomela*. At p. 156, K. & S. speak of some larvæ as being "gibbous above, and flat underneath; as those of *Chrysomela*," &c. To this section the term *Heliciform* might perhaps be applied; at least, the superficial resemblance is as striking as in the case of the other section and *Pediculus*. In the case of some larvæ feeding on water-mint, which I found in July, 1877, and which subsequently yielded beetles of *Chrysomela varians*, I find the following description in my note book: "One of the largest is 2—2½ lines long, and at the highest point of abdomen 1½ line high. It is laterally compressed. The head and prothorax are darker than the rest, and project from the dull-coloured body, which might be described as two-thirds or three-fourths of an oblate spheroid standing upon its truncated part. The insect does not extend itself much in walking, and, when alarmed, draws itself in, tail towards head, when it is well fitted for rolling, and lets go. It is not anopluriform. The head is black, flattened in front, and slightly bilobate; porrected in travelling. The antennæ are conical, pretty long for a larva, banded alternately, light and dark, and are retractile within the head. . . The prothorax is black also above, somewhat semicircular or rounded posteriorly where it overlaps the second segment. Here the colour changes to the dull greenish-drab of the rest of the body. The legs are pretty long, jointed, and furnished with single claws. The spiracles are a row of seven or eight black dots on either side, with a minute white (or clear) eye in the centre of each. . . A faint line runs somewhat archwise between each pair of spiracles, and from the angular apex of this line, which is nearer to the spiracle in front, a similar faint line runs up the side for a short distance, then forks, and the two branches, crossing the back, intersect with similar branches from the adjacent lateral

transverse lines, and are so continued on to the other side, thus forming along the back a series of transversely elongated lozenges, touching one another at their obtuse angles. The larva feeding looks very like a depressed *Helix* (shell) with the mollusc out and crawling." Very similar to these are the larvæ of *Chr. polita* and *Banksi*, both of which I have reared from the egg to the imago; and *fastuosa* has the same essential characters, at least as far as I was able to trace them, which was up to the completion of the first moult.* These four species feed on labiate plants: *polita* and *varians* on *Mentha*, *Banksi* on *Stachys*, and *fastuosa* on *Lamium*. Stephens placed the latter beetle in his sub-genus *Gastrophysa*, Chevrolat along with *raphani* and *polygoni*, living on plants of a different natural order—*Polygonaceæ*. The points in which *fastuosa* agrees with *polita* and *Banksi*, and differs from *G. raphani*, may be stated as follows: the glutinous matter accompanying the eggs, and which, according to Von Siebold, is the disintegrated portion of the *tunica propria* which accompanies them into the oviduct, is very abundant in *Gastrophysa*, dries up very slowly, and remains always more or less sticky. In *Chrysomela* it is scanty and dries up quickly into a brittle substance, so that the eggs, when in clusters, are readily broken asunder and scattered about like ripe seeds. The eggs in hatching, open in both cases, by a longitudinal slit over the dorsum of the larva; but, in *Gastrophysa*, the empty shell remains gaping, and tends to collapse, whilst in *Chrysomela*, the slit closes so accurately and the shell retains its original shape so completely, that it is often difficult to tell whether the larva has escaped. I have seen a young larva of *Banksi* that had come out of the egg tail first, caught by the neck in the elastic shell, which it dragged after it but could not escape from, like a mouse in a trap. In *Chrysomela* the eye-spots are six, in two rows of three each, on each side of the head. In *Gastrophysa* the external spot of the posterior row is wanting. Very conspicuous on the meso- and meta-thorax of the *Gastrophysa* embryo within the shell are four large black spots in the form of a square. In *Chrysomela* the equivalent spots are six in number, the additional pair being on the first abdominal segment; and they diminish in size from before backwards.

The larva of *Gastrophysa* is tuberculate, and agrees generally, especially in the points which I have italicised, with the description of the larva of *Chr. (Lina) populi*, as given by Westwood (Modern Classification, vol. i, p. 388)—"This larva (fig. 48, 9, &c.) is of an

* I have also found a larva of this type feeding on oat leaves. It was probably *Chr. graminis*, but I did not succeed in rearing it.—J. A. O.

oblong-ovate form, of a dirty greenish-white colour, *with numerous black scaly spots; its meso- and metathoracic segments are furnished with two large lateral, conical tubercles, and the abdominal segments have also two rows of smaller dorsal and lateral tubercles, from which . . . drops of a fetid fluid are emitted when the larva is alarmed.*" The *Chrysomela* larva, on the other hand, has the same general resemblance to that of *Timarcha*, as figured by Westwood (*op. cit.*, p. 389, fig. 48, 2). The larva of *Gastrophysa* moults twice before pupation, retaining the same larval form. *Chrysomela* moults three times: before the first moult the young larva is hirsute, but afterwards nearly smooth, without hairs, or with only a very fine pubescence, and without warts or tubercles. The *Gastrophysa* larva is always depressed and extended: that of *Chrysomela* laterally compressed, with the manitrunk and abdomen humped—rising from the darker scaly head and prothorax in the manner of the shell from the snail in crawling. Before the first moult the larva, with its arched hairy back and conical ear-like antennæ, is often ridiculously like a young kitten. In all these points—character of shell,* number and arrangement of eye-spots, and dorsal warts, number of moults and general anopluriform appearance—the larva of *Prasocuris marginella* agrees with *Gastrophysa* and differs from *Chrysomela*.

One other point of interest remains to be mentioned, a point of agreement between *Gastrophysa raphani* and *Lina populi*. At pp. 242—3 of vol. ii, Kirby and Spence, speaking of *osmateria*, say: "The grub of the poplar beetle (*Chrysomela populi*) also is remarkable for similar organs. On each side of the nine intermediate dorsal segments of its body is a pair of black, elevated, conical tubercles, of a hard substance; from all of these, when touched, the animal emits a drop of a white milky fluid, the smell of which, De Geer observes, is almost insupportable, being inexpressibly strong and penetrating. These drops proceed at the same instant from all the eighteen scent-organs; which forms a curious spectacle. *The insect, however, does not waste this precious fluid; each drop instead of falling, after appearing for a moment and dispensing its perfume, is withdrawn again within its receptacle, till the pressure is repeated, when it reappears.*" See also plate xviii, fig. 1. I wish to call attention to the sentence I have underlined, for a reason which will be immediately apparent. I wish, in fact, to ask: is it quite certain that this emitted matter is entirely

* The nature and amount of the glutinous matter is not obvious in the case of *Prasocuris* eggs. The insect cuts a small round hole in the hollow petiole of a *Ranunculus* leaf and deposits the eggs, to the number of 4 or 5—7 in the interior. —J. A. O.

and only a fluid—a secretion—and not rather a portion of the substance of the animal itself? The larvæ of *G. raphani* are furnished with similar latero-dorsal tubercles, of which the four on the meso- and metathorax are the largest. On the upper surface of these a minute puckered pore may be observed. But, although I have been breeding these larvæ for years, it is only recently and accidentally I have discovered that under peculiar circumstances (circumstances, however, reproducible at pleasure) the larva emits from these tubercles a double row of clear liquid-like (stalked ? and) capitate protrusions, which, coming and going simultaneously, instantly brought to mind the figure in K. & S. on plate xviii. The conditions requisite for evoking this phenomenon in the case of *G. raphani*, are exposure to strong sunshine in a close moist atmosphere. The larvæ may then be observed as with a row of glass bead-headed pins stuck in on either side. But, at the least disturbance, these instantly disappear, so that I could not touch them to see whether they were fluid or not. They do not seem to be accompanied with any smell. It was only afterwards, under different circumstances, I was able to arrive, with tolerable certainty, at the conclusion that these bead-like processes from the *Gastrophysa* larva are not a liquid secretion, but an everted portion of the insect itself, rather comparable to the horns of certain caterpillars.

In what I call a *double* batch of between 80 and 90 eggs laid (August 26th) by a ♀ which, having been originally kept as a virgin, and which in that state laid some parthenogenetic eggs, was afterwards allowed to become impregnated, but became so only to an imperfect extent,—in this batch, along with some perfectly healthy larvæ, I found many that perished in the hatching, and among these several in which these protrusions from the four thoracic tubercles were very striking. They were quite analogous to those observed in the older larvæ, and were emitted from the same parts, viz., the pores of the latero-dorsal tubercles of the thorax, the only part out of the shell; and as they were no longer spherical, but elongate finger-shaped, and as they persisted for many hours—in fact, were never withdrawn, during which time they exhibited lateral twitching movements, I could not doubt their non-fluid nature. And this has suggested to me, that in the case of *Lina populi* also, the main portion of the extrusion underlying the milky, opaque, odorous fluid, may be an analogous solid portion of the animal itself.

Milford, Co. Donegal :

October, 1880.

THE LIFE-HISTORY OF *GRAPHOLITHA NIGRICANA*.

BY JOHN H. WOOD, M.B.

The occurrence of this insect in England has been already recorded in this Magazine (Vol. xiv, p. 241) from a single specimen taken here in the summer of 1875 or 76. As, however, it had been repeatedly looked for since without success, I was beginning to fear it was an accidental introduction that had failed to established itself, when, on July 17th, 1879, I beat a specimen in fine order out of a group of silver-fir (*Abies picea*). Two days later I found the little moths flying in the early afternoon round these same fir trees. They flew rather high, but gusts of wind occasionally brought them within reach of the net, and I secured nearly twenty specimens, and then desisted from fear of working the species too hard. At the end of the month though much occupied with other matters, I made an effort to visit the locality once more, with the hope of getting, if possible, a gravid female. On this occasion no moths were to be seen flying round the trees, but I beat out of the lower branches two worn individuals. These were placed in a bottle with a sprig of *picea*: one of them died very shortly, but the other lived a week, and laid seven or eight ova. These, with the exception of one or two that were laid on the cork of the bottle, were deposited singly on the needles. They were large, round, full, and very conspicuous for the ova of so small a moth, of a dirty-white colour, which afterwards became reddish, this change, being seen under a lens, to be due to the development of an irregular band of that colour round the base. Early in September, the larvæ appeared—little yellow fellows with black heads. They were placed on fresh sprigs of the silken fir, but nothing more was seen of them, nor could any trace of their workings be afterwards found in leaf or bud, though carefully looked for. Still, I had little doubt from the evident liking the moths had for this fir, that it was the proper food, and that there would probably be little difficulty when spring came round of again taking the matter up. On the 15th of February, the attempt was made, and successfully. I found the larvæ feeding in the buds, indicating their whereabouts by the covering of silk spun over the spot at which they had entered. The terminal buds of the side shoots were those chiefly attacked. These are usually arranged in sets of three, and the larvæ eat them out one after the other, converting them into a common cavity. At this date the larvæ was still very small, brown, and with black head and plates. Towards the middle of April they became full-fed, when they came out of the buds

and affixed their cocoons, which were made of *débris*, and were rather fragile, either to the outside of the buds or in the angles of the shoots. Five moths emerged. The full-grown larva is soft, fat, and shining, of a dirty-yellow colour, with just the suspicion of a greenish tinge in it on the thoracic segments. Head small, and deep black, as is also the plate on 2nd segment.

I may add that the silver fir grows remarkably well in Herefordshire, and often reaches a large size, but the group of trees that supplies *nigricana* is only of some twenty or thirty years' growth. It is not a fir that seems much liable to the attacks of insects; its stiff, thick needles are seldom seen marked by their mandibles, and with the exception of the above, and the larva of *C. distinctana* that lives in the needles, no other Lepidopterous larva appears to feed upon it in this neighbourhood.

Tarrington, Ledbury :

11th October, 1880.

FURTHER NOTES ON THE NATURAL HISTORY OF *BOTYS*
PANDALIS.

BY WILLIAM BUCKLER.

That I am able this year to offer a few more observations on the larva of *pandalis*, as a supplement to those at p. 28, *ante*, is owing to the great kindness of Mr. W. B. Fletcher, who sent me on May 27th, a batch of eggs laid by a female he had beaten out from a tangled growth of rose and bramble in the New Forest.

These eggs were laid in a chip box, in five separate flat patches, containing from ten and upwards to twenty in each, as near as they could be counted with aid of a strong lens, which also showed them to be somewhat overlapping one another, yet withal showing so smooth a surface as to look like a deposit of yellow grease upon the chip.

Four days after I had received these eggs, there appeared on many of them two most minute dusky specks, and after two more days strong bluish-black marks (doubtless the ocelli, mandibles, head, &c., so accurately observed by Mr. Jeffrey). Every day produced these appearances on more of the eggs in succession, while from the most forward at intervals the larvæ were hatching by night, when on 8th of June, the remainder were fatally arrested by a sudden fall in the temperature.

On the 2nd of June, the first four young larvæ were as an experiment placed with leaves of rose and bramble; the next four

with leaves of *Teucrium scorodonia*; after a day or two I found the former had gnawed a little of the cuticle from the softest of the bramble leaves only, thus causing their white bodies to be very faintly tinged with greenish, while the latter had made holes quite through the leaves of *Teucrium*, and evidently liked their food so much better, that afterwards I kept all the larvæ entirely on *Teucrium*, and they thrived on it remarkably well; but this food certainly seemed to influence their colouring, as they were all very much paler than the brood of last year, fed chiefly on other labiate plants.

The larvæ had constructed their first cases by 25th of June, and I noticed some of these, as well as one or two of a later period, varying from the usual pasty-shape, and having a more fusiform outline; and for some time leaves of their food-plant furnished the materials, until by accident a piece of honeysuckle got introduced, and a case was cut from it; after that I made trial of other leaves, until the preference seemed given to those of *Rubus corylifolius*, from which latterly all the cases were fabricated.

Early in July I established the larvæ in a large glass vessel holding plenty of *Teucrium* sprays standing upright, secured at the top with stout unbleached calico, an arrangement allowing me to watch, without disturbing the shy little creatures; and I soon found their habit was to remain constantly hidden in the case, whether lying on the surface of a leaf, or hanging, as they would for hours, suspended from a leaf or a stem by a dirty-coloured thread half an inch or less in length; and even when desirous of feeding they put forth their anterior segments only, for the purpose of reaching the part of the leaf they meant to attack, and then immediately, with a little jerk, pulled forward the case over the segments they had exposed in moving, and fed away as it were by stealth.

Occasionally one could be seen attempting the difficult task of ascending the glass from the bottom, and of course often failing to secure a footing on the slippery surface; but during these efforts, made with half its body exposed and stretched to the utmost extent, if it chanced to touch any part of the food plant for a foot-hold, the case would be quickly drawn up over it, a performance which reminded me vividly of an old acquaintance—the aquatic *nymphæalis*;—but while thus engaged it would at the least alarm shoot back in an instant within the case, often causing it to fall lightly to the bottom, and there, lying perfectly still, it had the natural appearance of a mere fragment of leaf rubbish.

The colouring of these larvæ was light pinkish-drab above, and much paler beneath, the darker dorsal line invariably noticeable *between two pale lines* (a detail inadvertently omitted in my previous description), the tubercular shining spots though blackish on the thoracic segments were on the others of a warm lightish brown: when full-fed and almost ready to spin up, the length was about an inch, and the colouring changed to a very pale yellowish flesh tint except just at each end of the body.

When all but one were spun up in their cases, and I wished to examine that one in mature condition, I tried to push it out of its case with a piece of string, but though this passed through from end to end it failed to expel the larva, whereupon I stripped it of the case piecemeal, and kept it unclothed until I had figured it; then I supplied it with various leaves, but it refused to utilize any of them for a new case, and eventually took up a new position on the stout calico top of its prison; twice I removed it and put it first on a leaf of bramble, and then on one of beech, but it would persist even a third time in returning at night to the same spot as though it had lost reliance on any leaf, and there it expended five days of hard labour in cutting through and fashioning the tough material into a pasty-shaped case, which it moored to a few leaflets of its food plant, and spun up on the last day of August.

On October 22nd, I luckily bethought myself of the three perfect insects of last year's brood that emerged in autumn, and at once inspected the pot of this season's pupæ and found two perfect specimens, male and female, quietly sitting on the leno cover; this, without disturbing the moths, I removed to a fresh pot, and on the 24th, found presumptive evidence of their having paired, in a patch of the deep yellow eggs laid on the white surface near the bottom.

Whether in our climate the imago would emerge at this time of the year when under natural conditions I should think is very doubtful; in a warmer climate it seems to be regularly double-brooded, for Guenée says it flies "en mai, puis juillet et août;" perhaps therefore in hot summers a second flight of moths might occur in August with us, but hitherto only one flight has been recorded, the date of which Wood,* Humphreys and Westwood, and Stainton agree in giving as (the beginning of) "June."

Emsworth: November 5th, 1880.

* 815 *Angustalis* } Wood, "Beginning of June."
 816 *Terminalis* }
 H. and W., "About the beginning of June."
 St., "VI."

ON THE DISTRIBUTION OF *DAMASTER*, WITH DESCRIPTION OF A NEW SPECIES.

BY GEORGE LEWIS.

For the study of certain forms of *Coleoptera* which are limited in their distribution, the fauna of Japan is convenient, inasmuch as the country covers over fourteen degrees of latitude, and the greatest breadth of unbroken land is barely five degrees in the widest part. The Archipelago is cut up into sections by dividing seas and straits: on the north by the Tsugar Strait, in the south by the incursions of the inland sea, while the main island in latitude 35° is geographically much broken up by the Owari Bay, Biwa Lake, and Wakasa Bay, and over this last line many of the southern species do not pass. Let us consider the position which *Damaster*—an endemic form of *Carabus*—takes in a country thus topographically divided, and see how changes of climate modify varieties and create species. In Kushiu, the southern part, we find a large black species of nocturnal habits measuring 29 lines; a species of such vigorous and substantial habit that we almost instinctively look on it as the father of every *Damaster*. The forests it inhabits are those with summers of sub-tropical heat and length, ushered in by heavy rains, with little thermal change day or night. The trees there attain considerable height and girth, and through many groves the sun scarcely penetrates. A few miles northward of this district, near the well-known volcano of Simabara—the summit of which is sometimes in mid-winter capped with snow—the alleys are composed of decaying lava, and on such a soil the trees are of more moderate growth, and easily penetrated by the cold winds of the higher altitudes. Here, although only a few miles from Nagasaki, are great climatic changes, and we find *D. Lewisi*, a half-starved form, or to speak, of *D. blaptoides*. We then pass considerably more to the eastward, but only $1\frac{1}{2}$ degrees north, to Hiogo. Again we find the soil, climate, and vegetation correspond with Simabara, and the same species of *Damaster*. Crossing the Biwa-lake-barrier into the Yokohama district we come to quite a different form of insect, and we need not look far for reasons of change: we find *D. pandurus*, a clumsily-formed species, in which much of the elegance of the outline in the genus is lost, and the elytral mucrones almost obsolete, and with these changes colour first appears. The winters of Yokohama are comparatively severe: snow not infrequent, and cold winds from adjacent snow-covered mountains continual, penetrating the forest lands, and the soil becomes ice-bound, sometimes for days together. On a

mountain in latitude $36^{\circ} 30'$ I have taken a variety of this species, with an almost bright blue thorax, and here, on the 15th June last, I traversed snow at intervals, some feet in thickness, under the trees.

The next species is *D. Fortunei*, found in lat. $38^{\circ} 30'$, on Awasima, by the late Dr. Adams, and I will remark three things regarding it: the ♂ has the tarsi (in common with the next two species) very slightly dilated, the thorax is bronzed, and I presume it inhabits a colder climate than *D. pandurus*, as the Kuro-suwo, or warm stream of Japan runs up the east coast, and the west has no such pleasant influence.

Recently, in latitude 41° , I have taken a series of a species with the head and thorax of a rich coppery-red hue, and elytra green and partly metallic. Finally, crossing the strait of Tsugar to the island of Yezo, we find *D. rugipennis*, another bright coloured species. Both the last are near allies, and agree with *D. Fortunei* in general outline and form of the tarsi. In the district of *D. viridipennis*, the new species, snow lies on the length and breadth of the land three or four months in the year, and there is frequently snow remaining on some of the higher mountains throughout the summer, and a similar, though somewhat colder, climate prevails in South Yezo. The mean temperature in latitude $43^{\circ} 3' 56''$ N. was, in January, 1878, at 7 a.m., 16° F. and in July, only 64° , and August, 65° , and the depth of snow (*mean*) January, 11 inches, and February, 48 inches.

I am endeavouring to discover whether *Damaster* in any form exist on the north-east coast, in latitude 44° , for there the Kuro-suwo leave the coast, and the sea in mid-winter is a mass of ice for two miles from the shore, and, following the rule of the others, a small highly coloured species would occur here, if the genus extends so far.

Thus we see in tracing *Damaster* from the south to the north species become smaller, and step by step modified in form, with colour appearing the higher we go, either in altitude or in latitude. In the mountains of central Nipon, we have the blue *D. pandurus*, and, in the north, metallic species.

The general change of contour and tarsal development and divergences from the type easily explained by evolution, and, of course the cause of colour may be bracketed, too, under the same general laws. In the south, the warm nights, with summers of tropical heat, are well suited for the large, nocturnal, black-coloured species we find there but the genus, in forcing its way north, must, as a warmth-loving creature, accommodate itself to circumstances. Passing from the tropics, it becomes either diurnal or crepuscular (for it gradually enters the regions of twilight), and assumes the colours we naturally

look for in diurnal insects. *D. pandurus* in Yokohama comes freely to sugar, and is well-known to Lepidopterists there, as a nocturnal species, but of *D. rugipennis* I have five examples taken at sap at five o'clock in the afternoon, and I have more than once taken it crossing my path while the sun was well over the horizon.

In a wingless genus, such as the present, it is likely that some of the larger islands may possess species peculiarly their own, and perhaps *D. Fortunei* is one of these; but in this case I should not look for any abnormal variety, but a species closely allied to that of the adjacent land. There is no record at present, I believe, of two species inhabiting the same district.

I add a brief description of the new species above referred to:—

DAMASTER VIRIDIPENNIS, *sp. n.*

D. Fortunei proxime affinis, capite thoraceque late purpureo-cupreis, elytris rugoso-punctatis. sub-iridibus.

Hab.: North Nipon.

Long. corp., 16—18 lin.

Of the same facies as *D. pandurus* and *Fortunei*, the head and thorax are of a rich coppery-red, the latter, with transverse striæ, has a very distinct smooth medial line. The elytra are in colour an obscure green on the disc, gradually brightening towards the base, the margins being quite metallic. The sculpture and punctuation of the wing-cases are after the pattern of *D. rugipennis*, but the punctures are not quite so deep, and the longitudinal striæ are always more or less visible. The colour of the head and thorax is slightly communicated to the under surface of the whole body. The ♂, like *D. Fortunei* and *rugipennis*, has the tarsi perceptibly dilated.

Awomori, Japan:

September 6th, 1880.

Habits of Bombylius.—The following notice is an important addition to the little we know on the habits of *Bombylius*. It is extracted from an article entitled: "The locust scourge," by J. G. Lemmon, contained in the San Francisco Weekly Bulletin, of September 15th, 1880.

"Another enemy (of the grasshopper) which has proved very destructive in Sierra Valley is the larva of an insect whose full grown form was unknown until this spring. It seeks out a nest of eggs, eats the contents of the whole nest (24 to 32 eggs) one by one, pushes the shells aside, while his own body, big and fat with the feast, fills the whole case, in which condition he curls up and enters upon his long winter nap. This dormant stage lasts till spring, during which time the grub is about half-an-inch long and one-fifth thick, being largest in the middle, and tapering slightly towards its head and tail. In this state several specimens, at different times, have been sent to Prof. Riley in Washington, but he failed to perfect them in his vivarium. However, the question has been solved this spring in Sierra Valley. Some earth, with an ascertained number of this larva therein, was carefully watched under glass. In July, a beautiful little velvet-bodied fly, a species of *Bombylius*, appeared, having a long black beak, with which it sucks nectar from flowers, &c."—C. R. OSTEN-SACKEN, Florence: November 16th, 1880.



Beautiful variety of Arctia villica.

—The variety of *Arctia villica* here figured was taken by me some years ago at Guildford and is now in my collection. Unfortunately the margins of the wings are somewhat damaged, as a cat had a hand (or rather a paw) in its capture, but the markings are as

clear as in the sketch. I had overlooked it until overhauling my boxes last season.

I should be glad to know if a similar variety has been met with by other collectors, as this is the only specimen I have seen.—F. WALTER SAVAGE, University School, Hastings: November, 1880.

A list of Micro-Lepidoptera for collectors.—In the last part of the 41st volume of the “Stettiner entomologische Zeitung,” recently published, is a list of the Pomeranian *Pyralidina*, *Tortricina*, *Tineina*, and *Pterophorina*, in all 941 species. This list, compiled by F. O. Büttner, with additions by Prof. Hering and Dr. Schleich, is a model of concentrated information, which will not only be, primarily, of great service to collectors in Germany, as giving to all of them in a compendious form knowledge acquired by few, but it may also, for the same reason, be of essential use in this country. With many exceptions, the hitherto known British species are included; of the others it is very possible a good many may yet be found in Britain, and this list may be of much assistance in discovering them; it may also aid in obtaining more examples of some of our rarities; in both cases, by the indications of habitat, season, and larva-food, all or any of which may not be known to us. The list will be especially advantageous to those collectors who rear larvæ. The following extract, taken at random, gives a fair idea of the plan of the work:—

GRAPHOLITHA, Tr.

“40 (1131). *Roseticolana*, Z. The moth in June on wild roses. The larva in autumn in the fruit, which thereby becomes discoloured. The transformation in decaying wood, stems of plants or the like. In captivity the larva bores into the dry pith of the elder given to it for that purpose.”

Our collectors may also learn, amongst other things, that the law of priority of name is followed as a matter of course; that the uniform ending of specific names in *alis*, *ana*, *ella* and *dactylus*, which was once so much insisted on in this country as the proper thing, is simply ignored in Germany—the fatherland of the literature of *Micro-Lepidoptera*.

It is sad to find, by an obituary notice in the same part of the “Zeitung,” that the author of this list, F. O. Büttner, the most assiduous of the Stettin collectors of *Lepidoptera*, and the discoverer of many new species, died on the 4th June last at the early age of 56 years.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 19th November, 1880.

Notes on Coleoptera in Sussex.—The present season seems to have been particularly favourable to the propagation of the *Bledii*; in company with Dr. Power, on the 16th of August, I visited a locality near Shoreham, which I had long thought would produce something good, and where I had before found *Cillenum*

laterale, and where the Doctor's quick eye and acquaintance with their "casts" had brought *Bledius unicornis* to light. We soon got it in abundance, proving this species not to be confined to the western part of our shores. I had before taken it at Dawlish, where, years ago, Mr. Parfitt discovered it, but I did not then know the little "casts" of sand rejected from their burrows.

In another locality, two miles from here, *Bledius tricornis* was in profusion. The first two or three specimens I found, appear to me to be *spectabilis*, and I am now disposed to doubt the specific value of these two forms. The horn in the males of both this and *unicornis* certainly varies in development, and the infuscation of the elytra is not a sufficient character in itself to warrant their separation.

Here we searched for *Dyschirius extensus*, Putzeys, but in vain; two or three hours' work only yielded three *D. nitidus*, which fell to my share. However, a week after, I had the good fortune, in company with the Rev. H. Gore, to secure eight of this rarity, and Mr. Gore got one more. Our thanks are due to Mr. Brewer, who indicated to us the locality, where he found it twelve years ago.

Having thus got my "eye in" for *Bledii*, numerous casts in my drive and garden footpaths were explored, and turned out to be those of *B. opacus*; while I may mention that while at Dieppe, not long since, *B. longulus* was not uncommon in a sandy part of the cliff.

Other species found at Shoreham were *Pogonus littoralis*, abundant; *Limnæum*, *Heterocerus femoralis* and *sericans*, *Philonthus corvinus*.

I have a specimen of *D. extensus*, taken at Lancing, in 1871, but which, owing to its small size, I had not recognised before.

I lately found in Mr. Gore's collection several specimens of *Cryptocephalus frontalis*, Marsh., Gyll.; he had found them at Rusper, in the precise spot where I obtained one when I was in charge of his parish in 1873. This has always been a rarity with me. This is the season for *Lycoperdina*: it is rather common here in puff-balls.—H. S. GORHAM, Shipley, Horsham: November 17th, 1880.

Sitones ononidis in Suffolk.—On the 29th of September, when sweeping in a rough field in the grounds of Tendring Hall, Stoke-by-Nayland, Suffolk, I took about twenty-five specimens of *Sitones ononidis*. It was not until I had returned home and showed the insect to Dr. Power that I knew what it was. Had I been able to identify it on the spot I could probably have taken more. I have no recollection of seeing any *Ononis* in the field; the plant that was most abundant was the common field-thistle. As this is a new locality for this scarce species, it may be worth recording.—ARTHUR COTTAM, Eldercroft, Watford: November 2nd, 1880.

Capture of a rare Hymenopterous insect near Lyme.—On the 3rd of September last, I captured a ♀ of *Didineis lunicornis*, one of the rarest of our fossorial Hymenoptera, on the top of the Golden Cap Beacon, four miles east of Lyme Regis. I happened to sit down close to it as it was scrambling through the short stunted herbage near the edge of the cliffs.—F. S. SAUNDERS, Wray House, Lingfield Road, Wimbledon: November 15th, 1880.

Oligoneuria rhenana.—On the 25th of August last, I happened to be at Basle with an afternoon and evening to spare. A thunderstorm at 1 p.m. was succeeded by beautiful weather, clear, and with scarcely a breath of wind. So I proceeded to a locality on the right bank of the Rhine, some three miles below the city, where a

little earlier in the season in 1879, some interesting *Trichoptera* were collected. This year, owing to circumstances not known to me, the insects were not of the same set. But I was amply repaid in another way. At a village a little further on, a stream runs into the Rhine almost at a right angle, and at about 5.30 p.m. I saw *Oligoneuria* flying rather wildly up-stream, but in no great numbers. On my way back to Basle there were also a few on the Rhine itself up to 6.30; but at that hour, as if by magic, the air above the river was one mass of *Oligoneuria*, all flying in a steady business-like manner up-stream, and against the little wind there was. They avoided the sides where the current is slower, and the lowest were at least eight feet above the surface, so the fishes had no chance. Such a sight as this is worth a journey from England to an entomologist. It can be no exaggeration to say that millions passed up-stream before I again arrived at the old bridge. This latter disconcerted the swarm, as it was right in the line of flight, and any number could there be caught in the hand. Even the usually stolid citizens were struck by the phenomenon, so I suspect the swarm was greater than ordinarily. If there were a stopping-point, up-stream, the accumulations there must have been enormous.

One interesting observation was made, viz: that *Oligoneuria* casts its subimaginal skin when on the wing, and does not rest to do it, as do other *Ephemeridæ*. Mr. Eaton tells me he also has made a similar observation, and is of opinion that the pellicle on the wings is not shed with that of the body, because he could never find this sheathing of the wings on the cast skins. *O. rhenana* occurs also at Zürich.—R. McLACHLAN, Lewisham: November 1st, 1880.

Charagochilus Gyllenhali macropterosus.—The common *C. Gyllenhali*, of short broad-oval form, has the elytra not longer than the abdomen, the cuneus and membrane being abruptly deflected and closely incumbent thereon. On the 26th September, 1879, in Darenth Wood, I swept up an example (♂) which agrees with the characters of this species except that the elytra are not deflected but horizontal throughout and extend far beyond the end of the abdomen, the membrane especially being enlarged both in length and breadth. The antennæ, particularly in the second joint, and the posterior tibiæ are longer than in the usual form. The length of the insect is 2 lines fully. I cannot find that this macropterosus form of this species has ever been observed, and I think, therefore, that it is uncommon and worth noting.*

Reuter, in his "Genera Cimicidarum Europæ," puts *Charagochilus*, Fieb., *Systratiotus*, D. & S., and *Pæciloscytus*, Fieb., as sub-genera of one genus, to which I see no objection; but he calls this genus *Pæciloscytus* of Fieber, which it evidently is not—but of Reuter only. If the names are to be regarded merely as generic appellations which may be used without reference to the application given to them by their author, then any one of them would do as a collective term; in point of fact, *Charagochilus* has numerical precedence in Fieber's "Criteria zur generischen Theilung der Phytocoriden" (Wiener ent. Monatsch., ii, 1858).—J. W. DOUGLAS, Lewisham: November 15th, 1880.

Macropterosus forms in the genera Blissus and Plinthisus.—In connection with the foregoing note on maximum development, I may draw attention to the interesting

* See the remarks of Dr. Reuter on polymorphism in Hemiptera in the Ann. Soc. Ent. France, 1875, p. 225.

articles by Prof. Karl Sajó, in the "Ent. Nachrichten" of November 1st, on the discovery in Hungary of the hitherto unknown macropterous forms of *Blissus Doriæ*, Ferrari, and on the capture of several macropterous examples of *Plinthisus convexus*, Fieb., hitherto very rare. I quote his remark on the most probable means of procuring fully developed forms: "According to my experience hitherto I can say that the larvæ are the best guides to the obtaining of macropterous examples. Where there are many larvæ and at the same time but few examples perfected, there may the most assiduous search be made; but where many brachypterous forms are already developed and only few larvæ left there is not much to be expected, at least I have sought in vain in such places. Perhaps this happens because the macroptera are first developed and then fly off. I am quite convinced that all the species of *Plinthisus* have a macropterous form."—ID.

Bothynotus pilosus at St. Leonards.—During June or July last year my brother brought me, with some *Rhopalotomus ater*, a developed ♀ of the above from the Cuckmere District. Thinking it was a variety of *Rhopalotomus* I did not make a note of the date or ask him the exact locality. Mr. E. Saunders kindly determined it for me later on.—E. P. COLLETT, 12, Springfield Road, St. Leonards: November, 1880.

Bothynotus pilosus, Boh. (*Minki*), near Hastings.—Two years ago my friend, Mr. Frank Collett, met with a fully developed female of this species somewhere near St. Leonards. This autumn (September 28th) I have taken two undeveloped females in a sand-pit within a short distance of the Rectory here. The sand-pit is situate on the outskirts of a wood of considerable extent. The occurrence of this species in the South of England is, I think, of considerable interest, since the only previously recorded station in Britain is, "On the hills between Loch Long and Loch Lomond," as recorded in Ent. Mo. Mag., vol. ii, p. 276, where the insect is fully described. Both sexes of the insect are figured in Ent. Ann., 1866, where it is said to be "of great rarity on the Continent."—E. N. BLOOMFIELD, Guestling Rectory: November 19th, 1880.

[These captures of *Bothynotus* in the South of England are of great interest. Reuter says it lives on *Pinus abies*, and he mentions that he took a ♂ in Finland in August and the larva in July. It is to be hoped, therefore, that a diligent search on the spruce firs in August and September may be rewarded with more specimens. The ♀ of this species is generally brachypterous, and a fully developed specimen, such as that taken by Mr. Collett, is of great rarity.—EDS.]

Capture of British Hemiptera-Heteroptera.—On the 31st July of this year, I revisited the locality (Crohamhurst, Croydon), where I took the 3 ♀ of *Atractotomus magnicornis* (noted in the last Vol. of this Magazine), the year before, this time I got about a dozen ♀ and 1 ♂, I expect I was too late for the ♂, and that they should be looked for in the beginning of July.

On the 28th July, I went to the locality on Wimbledon Common where my nephew, Mr. F. Saunders took *Lygus limbatu*s last year, and I succeeded in finding one ♀, after a long search, on the willows. I went again on the 14th August, and got two more; my nephew has also taken two, but this year, at any rate, it seems to be very scarce, all the specimens I have seen are ♀. Last year in August I took

at Hastings a good many specimens of a *Dicyphus* off *Epilobium*, which seemed strange to me; these I sent to Dr. Reuter, and he returned their names as *D. stachydis*, Reut., a species I believe undescribed at present but already recorded from Scotland by Mr. G. Norman. In the developed form it resembles *pallidus*, but may be known at once by its short thick antennæ.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: November 18th, 1880.

The pursuit of Entomology under difficulties in Belgium.—The Belgian Entomological Society has recently organized frequent excursions. One of these took place on the 11th July, to Calmpthout, north of Antwerp, a very favourable and productive locality, unenclosed and primitive in its nature, and part of the State domains. The result was that the party encountered a keeper ("garde champêtre") and two policemen ("gendarmes"), and that several Members of the Society were summoned to appear before the tribunal at Antwerp on a charge of trespassing. It so happened that the father of one of the parties is a magistrate and a distinguished legal official, and he procured the acquittal of his son and colleagues, by discovering that the law applying to trespassers left discretionary power with the judge in connection with the objects of the accused; in effect, the words are "*pourront être condamnés*," and not "*devront être condamnés*," as the keeper and policemen preferred to read them. It was advised that the Members of the Society should in future provide themselves with official cards of permission, so as to avoid being again exposed to misinterpretation of the law on the part of ignorant subordinate officers.

Review.

MONOGRAPHIE DER DEUTSCHEN PSOCIDEN, mit besonderer Berücksichtigung der Fauna Westfalens, von H. KOLBE (Auszug aus dem Jahresbericht der zoologischen Section für Westfalen und Lippe, 1879—80, pp. 73—142, pl. i—iv).

European *Psocidæ* are now receiving much attention. Very recently two important faunistic memoirs on the Family appeared, viz., those by Spångberg and Rostock on the Scandinavian and Saxon species respectively. And now Herr Kolbe shows that he has for some time been assiduously devoting his attention to it: the result is the production of one of the most important Monographs that has yet been published. The introductory portion is full in details. The author's generic arrangement and his ideas of the system of neururation, were foreshadowed in the Stettiner ent. Zeitung for this year, pp. 179—186. We are inclined to believe this neural system will not bear the test of analysis with regard to the homologies of neururation in other groups of so-called *Neuroptera*, but in a notice such as this, it is impossible to enter into details. We think, also, that too many genera have been founded; they may be tolerably natural so far as they go, but the necessity for elevating some of the groups to the rank of genera is much open to doubt, at any rate until a comprehensive study of the Family as a whole has been made. It is to be regretted that the author has applied names, as varieties, to certain slight vagaries of neururation not infrequent in these insects. Moreover, we cannot agree with the author in his great change of specific nomenclature in some cases. *Psocus longicornis* becomes *Ps. saltatrix*, although the author admits it is only "höchst wahrscheinlich" that Linné had this insect before him when he described his "*Phryganea saltatrix*:" another extraordinary innovation is made in the case of

Ps. nebulosus, which becomes *Ps. nebuloso-similis*, because Stephens described the ♀ as *nebulosus* and the ♂ as *similis*. Neither do we agree with the author in his appreciation of the genera *Troctes* and *Atropos*. But the friendly criticism of his fellow-workers will, no doubt, influence him in these respects; and his innovations are not bound to be accepted because they have been made.

In most other respects we know not how to sufficiently admire the care and labour everywhere evident, and the figures will be found of great service; this we say after having made a preliminary test examination with our own collection before us. The notes on habits are extremely interesting and very full. We welcome the advent of so careful and thorough a student of *Neuroptera*.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 6th, 1880. H. T. STAINTON, Esq., F.R.S., &c., Vice-President, in the Chair.

Sir Arthur Scott, Bart., of 97, Eaton Square, W., and Mr. F. E. Robinson, of Oxford, were elected Members.

Mr. McLachlan reminded the Meeting that at the October Meeting last year he had exhibited specimens of *Anthocoris nemorum* which had been considered to be occasioning damage to hops (*Ent. M. Mag.*, xvi, p. 141), and suggested they were only in search of some insect that was the actual culprit. The same correspondent had just sent him Dipterous larvæ (exhibited) extracted from the centre of the hop cones, and the cause of the mischief, which, however, was much less this year than last.

Sir S. Saunders exhibited apterous females and a winged male of *Scleroderma* bred from the cell of *Rhaphiglossa* in a briar stem from Epirus, thus authenticating the sexes of this genus.

Mr. W. F. Kirby exhibited varieties of *Argynnis Selene* taken by his son at Düsseldorf; two remarkably fine hermaphrodite examples of *Smerinthus populi* bred by Mr. Shuttleworth; a dark variety of *Hemerophila abruptaria* taken in London by Mr. Olliffe; and an hermaphrodite *Ennomos angularia* bred by Mr. Hudson.

The Rev. E. N. Geldart exhibited a variety of *Argynnis Selene* captured near Reigate.

Mr. Rolfe exhibited *Vanessa Antiopa* taken on Wimbledon Common on the 24th August last; *Acontia solaris* captured at Eastbourne on the 12th August; and a pale variety of *Plusia gamma*.

Mr. H. Ramsden communicated notes on two examples of *Pyrophorus causticus*, the fire-fly of Cuba, which he had brought alive to England.

Mr. A. H. Swinton read two papers on the effects of food in producing variability in *Lepidoptera*, more especially with regard to *Vanessa urticæ* and *Arctia caja*.

Mr. Butler communicated a paper on the genus *Terias*, with descriptions of new species from Japan.

Mr. C. O. Waterhouse communicated a paper on *Buprestidæ* from Madagascar.

Mr. Kirby called attention to the fact that M. E. André, who is publishing a work on *Hymenoptera*, is in the habit of printing descriptions of new species on slips loosely inserted in the parts of his book, apparently in order to secure priority. A discussion followed, in which several Members expressed strong opinions of regret

that it was not possible to enforce a rule ignoring such descriptions. A discussion also ensued as to whether or not the cover of a periodical or work was part of the publication. On this point difference of opinion was manifested, but the general idea was in the affirmative.

November 3rd, 1880. SIR J. LUBBOCK, Bart., M.P., F.R.S., &c., President, in the Chair.

Mr. E. Meyrick, of Ramsbury, Wilts, and Capt. Thos. Broun, of Auckland, New Zealand, were elected Ordinary Members, and Dr. E. Brandt, of St. Petersburg, was elected a Foreign Member.

Mr. C. O. Waterhouse exhibited, on behalf of Mr. Olliffe, a pair of dwarfed examples of *Epione vespertaria* taken at Arundel.

Mr. McLachlan exhibited the singular *Eucalyptus* galls described and figured in the present number of this Magazine. He stated, also, that in a letter received from Mr. D. G. Rutherford, from Camaroons, W. Africa, the writer mentioned that he had taken *Papilio Merope* and *P. Cenea in copulâ*, and had obtained eggs from which larvæ were hatched. Mr. Roland Trimen thought an error had occurred as to the name *Cenea*, and that the ♀ was more probably *Hippocoon* or one of the other W. African polymorphic forms of the ♀ of *Merope*. The statement was interesting as confirming the relationship of one of the forms.

Prof. Westwood exhibited saw-fly galls on a sallow, apparently not of the usual form; and a drawing of a very singular dipterous larva found on a stem of *Pelargonium*, and no doubt pertaining to the *Syrphidæ*.

Mr. W. F. Kirby exhibited, on behalf of the Rev. J. K. Brown, of Maidstone, a remarkable variety of *Epunda lutulenta*; and on behalf of Mr. Rolfe a specimen of *Apatura Ilia* which the latter affirmed he had caught in Pinner Woods last July. It was remarked that this example of *A. Ilia* was apparently old and had evidently been twice pinned.

Sir John Lubbock exhibited larvæ from the Troad, which Mr. Calvert had forwarded through Sir J. D. Hooker; they had lately been found in considerable numbers feeding on the eggs of Locusts, and were probably those of some species of *Cantharidæ*; very many locust eggs had been destroyed by them, and it was suggested they might perhaps be imported into Cyprus.

Mr. Roland Trimen exhibited the singular apterous Hymenopterous insect (already noticed at the Meeting of the 7th July) from near Cape Town, which he strongly believed was the ♀ of *Dorylus helvolus*; it had been found in a nest of a small red ant apparently of the genus *Anomma*, and the workers of this were attached to a winged female referable to Gerstæcker's genus *Dichthodia*, which that author regarded as probably the ♀ of *Dorylus*. He also exhibited cases formed by a South African Lepidopterous larva; they were formed of sand, somewhat flattened, and along each side were attached larger rough fragments of stone in a single row, thus giving the case much the aspect of a Myriopod; the larva was regarded as venomous by the Boers.

Sir S. S. Saunders read a paper on the habits and affinities of the Hymenopterous genus *Scleroderma*.

Mr. E. Saunders read a Synopsis of British *Heterogyna* and Fossorial *Hymenoptera*.

Professor Westwood read descriptions of new species of exotic *Diptera*.

NOTES ON *MACRO-LEPIDOPTERA* IN THE NEW FOREST IN 1880.

BY W. H. B. FLETCHER.

Having stayed at Lyndhurst from the middle of April to the end of September, with the exception of the month of June (which I spent at Wicken), I venture to send a short account of my captures, from which it will, I think, appear that 1880 has not been altogether a bad year for collectors in "The Forest."

Colias Edusa was very scarce, I did not see a specimen myself, and heard of only a very few being seen by others. *Argynnis Paphia*, var. *Valezina*, was, as usual, common. In August, 1879, I obtained a batch of about sixty eggs from a worn specimen of this form, the larvæ hatched out in September, they did not seem to touch their food-plant, but began to hibernate at once; and Mr. George Tate tells me that a few larvæ obtained by him this year acted in the same way. For want of care on my part, most of these little larvæ died in the winter; thirteen, however, survived, and fed freely on *Viola odorata*, *V. sylvatica*, and *V. canina*, the last-named being their food-plant in the New Forest. I obtained eleven pupæ, and bred from them, towards the end of June, 1880, three males and three females of the typical form, and five of the form *Valezina*.

Cynthia cardui, abundant here, as elsewhere, in 1879, in the present autumn was less common than usual, although the spring specimens were plentiful. The latter, owing to the bright sunshine in April and May, were a week or ten days earlier on the wing than they usually are in this district.

The larvæ of *Demas coryli* were plentiful on all kinds of trees from June to October, but absolutely swarmed in September.

Limacodes asellus occurred sparingly in July on the wing, and a few larvæ were taken by Mr. Styan and myself off oak and birch in September.

Lithosia quadra was plentiful in the larva, pupa, and imago states, and *L. helvola* was not uncommon towards the end of July.

In the spring, *Nola cristulalis* was very common on the trunks of trees, and its larva was beaten freely from beeches in June and July.

The larvæ of *Ellopia fasciaria* were plentiful on Scotch fir in the spring, as were also those of *Selenia illustraria*, *Eurymene dolabraria*, and *Odontoptera bidentata*, on all kinds of trees, towards the end of summer, some of the varieties of the last-named larva being very beautiful.

The larva of *Cleora glabraria* was common on the long lichens growing on beech, hawthorn, and oak, and the imago was obtainable from the same trees in July and August. All the species of *Boarmia* and *Tephrosia* were abundant, with the exceptions of *B. rhomboidaria* and *abietaria*, this latter I cannot find in any number in the Forest, having never taken more than two larvæ or imagines in a year, although I have several times beaten the yew trees for them.

The larvæ of all the *Ephyræ* were common in September, except that of *E. porata*, which I hardly know, the imago is, however, rare here, according to my experience. *Acidalia emutaria* and *straminata* seemed less common than usual; I netted a few *A. emarginata* one evening in Matley Bog.

I took three *Macaria alternata*, ♀, on as many nights, in the bogs, but the larvæ obtained from them did badly on sallow; but, fortunately, I beat a few full-fed off alder in August, together with some of *Eupisteria heparata*, the latter being abundant in larva and imago states. Amongst the *Eupitheciæ*, *centaureata*, *lariciata*, *albipunctata*, *exiguata*, *pulchellata*, and *abbreviata*, were more or less common as larvæ or imagines. *E. irriguata* was scarce on the wing, and, perhaps, more so than it would otherwise have been, had not the east winds, which prevailed throughout April and May, made it so hard to "spot" when beaten out of the oak trees. The larvæ, I learn, were fairly common in June.

The larvæ of *Collix sparsata* were, as usual, very common on the under-side of the leaves of *Lysimachia vulgaris*, in August, and those of *Lobophora sexalata* and *Scotosia undulata*, were not scarce on sallows in September, the latter preferring the tufty pony-trimmed bushes, most likely because they are more suitable for the making of their leafy tents. *Cidaria psittacata* swarmed at the ivy in the autumn, and its larva in the summer on oak, ash, and other trees. I was too late for the larva of *Tanagra chærophyllata* (locally "Smut"), so only found six, on the leaves of *Bunium flexuosum*.

All the *Drepanulæ* (except *sicula*) were taken as larvæ and imagines; *unguicula* being the most abundantly taken on the wing, and *falcula* and *lacertula* as larvæ.

Amongst the *Pseudo-bombyces*, the larva of *Closteria reclusa* was very common on *Salix repens*, those of *Dicranura furcula*, *Notodonta ziczac* and *palpina*, were not scarce on the larger sallows; *N. camolina* was common on most trees and bushes; and *N. dictæoides* on birch.

Stauropus fagi seems to have been more abundant than usual. I have heard of the capture of about forty specimens taken chiefly

between June 15th and July 10th, three of them fell to my lot, the result of three mornings' work. The species seems to have been on the wing for a long time, as I took a ♂ on May-day, and Mrs. Fletcher a ♀ on July 12th in very fair condition. Several of the larvæ were taken in August and September off oak and beech. Amongst the *Noctuæ*, I may mention the larvæ of *Cymatophora ridens* as being common on oak in June and July, of *C. duplaris* and *Acronycta leporina* on alder and birch in August, of *Orthosia lota* on sallow in the spring, and of *Erastria fuscula* in September on the long grasses growing under the fir-trees in the enclosures. I believe that the larvæ of *Hadena contigua* were plentiful on *Salix repens* and *Myrica gale* towards the end of the summer, but, unfortunately, I did not learn to know this larva until they had nearly all pupated, when Miss Golding-Bird kindly told me that the few remaining in my cage belonged to this species. I must now end these already too lengthy notes with an account of the unusual number of *Acronycta alni*, which have been taken in the Forest this year. About the middle of June, Mr. George Tate took a female of this species at rest on an old hawthorn. On July 17th, Mrs. Fletcher took a larva in the "bird's dropping" stage, and between this date and the end of the third week in August, one hundred and ninety larvæ were taken to my knowledge, thirty-six having fallen to the lot of my wife and self. By far the greater number of these were taken off alder, though several came off beech and oak, a few off birch, and I saw Mr. Norgate take one off hawthorn. Unfortunately, the saying, "No rose without a thorn" holds good with regard to these larvæ, for they are infested with parasites. First of all, there is a solitary grub which comes out of the larva when it would cast off its "bird's-dropping" skin, and don its gorgeous livery, and spins a piebald cocoon; then there are, I think, two gregarious species which, in parties of from four to twelve, crawl out of their victim when it should pupate and make dark-red cocoons; these pests have already reduced my stock to twenty, while my friends, Job's comforters indeed, tell me that were I to open the sticks thought to contain pupæ of *alni*, I should find yet more blood-red cocoons, and also that there is another species of parasite making its pupa within that of its victim. Should, however, any of these destroyers prove to be of interest, I shall hope to be able to hold them up to the execration of Lepidopterists in the pages of a future number of the E. M. M.

ON THE SPECIES OF THE GENUS *ORTHEZIA*.

BY J. W. DOUGLAS.

Two years ago, Mr. Henry Chichester Hart sent for my inspection examples of an *Orthezia* he had found in Ireland, saying that they appeared to him to be identical with a species he obtained at Disco North Greenland, which had been named for him *Dorthesia chiton* Zett., that it also seemed to be the same as *Coccus cataphractus*, Shaw, and requesting my opinion. My reply was that I believed it to be *Orthezia Signoreti*, F. B. White, that it seemed to agree with the species described by Shaw and Zetterstedt, and that both these latter and several others had been referred by Signoret, the latest writer on the subject, to *Orthezia (Aphis) urticae*, Linné. An article in the "Entomologist" for November, by Mr. Hart, on *Dorthesia chiton*, has been read by some of my correspondents to mean that I agreed with Signoret's conclusion, but I merely stated a recorded fact, not having at that time investigated the question. It would be superfluous now for me to say this, but that it gives me the opportunity to offer some remarks indicating that two species are confounded under the name *urticae*. These remarks were prepared long since, but reserved, because Mr. W. F. Kirby informed me that Mr. Hart intended to work on the matter thoroughly.

The species of this genus are dimorphous, that is, as in other *Coccina*, the males only are winged in the imago state. The following is the substance of Signoret's summary of the peculiarities in the natural history of the apterous forms (*Essai sur les Cochinelles*, 421)—particulars it is essential to know:

"We find examples having six joints in the antennæ, these are the young larvae; others with seven joints, more or less equal in size; others, also with seven joints, with a kind of scape, as in the *Hymenoptera*; finally, others with eight joints, these being the adult females. The individuals with seven joints have a peculiarity that we have not seen in any other genus (those in which the joints are of regular form are the female larvæ), namely: that those with the scape have in all the legs the tibia and tarsus united, and thus form but a single joint. It is not, therefore, wonderful that authors have indicated a certain number of species, which, up to this time we have not been able to find in the many places where we have collected the insects."

Of the apterous forms two kinds exist, for while in both the whole body, above and below, is covered with a close-fitting, wax-like (Signoret calls it calcareous), white secretion, and in both there is a well-raised, segmented border formed of this matter, there are yet two great differences, *constant throughout all the stages of life*, in the other d-

position of it in the two forms, offering *primâ facie* evidence that there are two species, and not merely different stages of development in one species as has been stated. (1). In one type the upper surface is smooth, almost flat within the border (which also is regular, compact, and smooth), and destitute of imbrication, the segments being distinctly visible from side to side, only divided in the middle by a continuous, longitudinal, impressed line. (2). In the other type the border is less regular and more flaky, especially in the adult, and the whole dorsal surface is covered with protuberant, overlapping, scale-like or flaky lamellæ in two longitudinal rows or ridges, whereby the segmentation of the body is quite hidden.

(1.) In the first type there are, in the adult ♀, other specialities:—the broad, short-oval form, the pale cream-white colour, the testaceous colour of the legs and antennæ, the tarsus as long as the tibia; the antennæ short, stout throughout; the broad caudal lamination projecting beyond the border to a comparatively short extent, its extremity broadly rounded, its surface longitudinally crenate (not lamellate). This caudal projection arises below the circumferential border of the body, which remains entire: it forms the covering part of the *marsupium*, which contains at first the eggs, and then the young larvæ. (The same kind of structure, but of larger dimensions, exists in *O. urticæ*.) To this type belong, as one distinct species (*O. cataphracta*),—

♀. *Coccus cataphractus*, Shaw, Nat. Misc., v, pl. 182 (1791), Gen. Zool., vi, 194, pl. 62 (1806).

♀. *Dorthesia cataphracta*, West., Intr. Mod. Class. Ins., ii, 443, fig. 118, 20 (1840).

♀. *Dorthesia chiton*, Zett., Ins. Lap., 314 (1840).

♀. *Orthezia urticæ*, Sign. *syn. partim*, Essai sur les Cochinelles, 423 (1875).

♀. *Orthezia Signoretii*, F. B. White, Scot. Nat., iv, 160, pl. 2, fig. 1, antennæ (1877).

In the Scotch examples, for which I am indebted to Dr. F. Buchanan White, there is, on the middle line of each of three anterior (thoracic) segments, a very small scutelloid process or appendage: these are represented in Shaw's figure, but are exaggerated.

The adult ♂ has not been observed, but Dr. Buchanan White says (*l. c.*): "I have only seen one ♂ larva, and that not in good condition, but, as far as I could judge, the antennæ resemble in structure that of the larva of *urticæ*."

The species appears to have been found only in northern regions—Lapland, Greenland, Norway, Scotland, Ireland, and the north of England.

(2.) In the second type, in the adult ♀, the other characters to be noted are:—the long-oval form; snow-white colour; the piceous

hue of the legs and antennæ; the tarsus but little more than half the length of the tibia; the antennæ longer and thinner than in *O. cataphracta*, the terminal joint tapering; the broad caudal lamella, which follows the two dorsal ridges, projecting very much in the rear, but slightly rounded posteriorly, its whole surface covered by a large fascicle of long, longitudinal, thin, sharp-edged lamellæ, into the base of which the posterior lamellæ of the border merge, these latter being longer throughout than in the previous stages of the insects' life. To this type belong, as one distinct species (*O. urticæ*), the ♀ of the following:—

♀. *Aphis urticæ*, Linn., S. N., 736, 30 (1767).

[Frisch, Besch. v. allerly Insecten von Teutschland, viii. 34, t. 17 (1730)].

♀. *Coccus floccosus*, De Geer, Mém., vii, 604, 9, pl. 44, fig. 6 (1778).

♀. *Orthesia characias*, Bose, Journ. de Phys., xxiv, 171, pl. 1 (1784).

♂ ♀. *Dorthezia characias*, l'abbé d'Orthez, id., 207, pl. 1, fig. 14—16 (1785).

♂. " " Westw., Intr. Mod. Class., ii, 445, frontisp., fig. 8 (1840).

♀. *Coccus dubius*, Fab., E. S., iv, 228, 27 (1794), Panz., F. G., 35, 21.

♂ ♀. *Coccus characias*, Fab., S. R., 311, 29 (1803).

♂ ♀. *Dorthezia urticæ*, Burm., Handb., ii, 76, t. 2, fig. 6 & 11 (1835).

♀. " " Zett., Ins. Lap., 314 (1840).

♂ ♀. *Orthesia urticæ*, Amy. et Serv., Hémipt., 624 (1843).

♂ ♀. " " Sign., Ess. Cochinelles, 423 (1875), (*syn. partim*), pl. 1, fig. 13, ♂ larva; pl. 21, fig. 1, ♂ imago; fig. 1, *g, h, i*, antennæ of embryo and ♂ and ♀ larva; fig. 1, *m*, ♂ genitalia.

A few words on some of this synonymy may be permitted. Linné says of the *Aphides* generally: "Species difficile distinguuntur, difficilius definiuntur," which is especially well illustrated in his description of *A. urticæ*, as follows:—

"Inter maximas hujus generis, tota alba, obtecta quasi setis; subtus vero lana alba, postice valde obtusa; de genere hæreo, utrum ad *Aphides* aut *Chermes* accedat."

This is vague enough, but reference is made to the antecedent work of Frisch, in which, under the title, "Von der weissen Blat-Lause auf der Matricaria," is a description from which the following is an extract:—

"Der Nacken ist mit drey über sich stehenden Blätlein bedeckt. Mitten auf dem Rücken geht eine Linie durch, welche neben mit zwey Reihen solcher weisser Blätlein besetzt ist, deren auf jeder Reihe sieben, als Schuppen über eine ander liegen. Der Leib ist oval, wenn man ihn ohne die Schauben betrachtet, und ist an den Seiten mit viel weissen und kurzen Bürstlein besetzt, als mit Franzen."

This agrees fairly with our insect: the figure is so small and indistinct, that it is worthless.

Fabricius appears to have first identified *characias*, Bosc, with *urticæ*, Lin., but apparently he was not very sure, for he uses the latter only as synonym of the former, which he still keeps, with an expression of doubt, as a *Coccus*. (S. R., p. 311.)

Of De Geer's species the figure is rude and unsatisfactory, but the description, as follows, is sufficient to denote our species:—

“Ce sont un grand nombre de flocons cotonneux en forme de lames feuilletées plates d'un blanc éclatant, qui couvrent tout le dessus du corps et le débordent même de tous les côtés; ces lames, qui sont un peu courbées, y sont placées très-régulièrement, se couvrent un peu les unes les autres, ou arrangées comme des tuiles ou comme les écailles des poissons; il y en a d'abord une couche au milieu du corps, plus courtes que les autres et arrangées sur deux lignes, de façon que celles de l'une de ces lignes vont rencontrer celles de l'autre rang par leur base, et elles représentent ensemble comme une petite feuille découpée. Les autres lames placées de deux côtés de la tête jusqu'au derrière, et formant deux rangs distincts, sont beaucoup plus longues que celles du milieu, comme je l'ai dit, débordant le corps considérablement, et elles sont toutes un peu courbées et dirigées vers le derrière.”

Zetterstedt described *urticæ* in order to point out the differences between it and his *chiton*.

The descriptions of *Coccus uva*, Modeer, and *Dorthesia Delavauxi*, Thibaut, both referred to this species by Signoret, I have not been able to see.

Burmeister (*l. c.*) refers “*Coccus glechomæ*, Fabr.” (without further indication), to the genus *Dorthesia*, as a distinct species, but I cannot find the description.

The male is described as of a light brown colour, smaller than the female, elongate; the head, thorax, and abdomen distinct; no rostrum; the antennæ very long, filiform, 9-jointed; wings, two (anterior), long, pale-greyish, with two longitudinal nervures (Westwood says there are also two minute halteres, terminated by a short seta); the abdomen at its termination with a pencil of long, fine, white hairs. The genitalia are of peculiar form.

The male, according to the observations of its original discoverer, as given by Amyot and Serville, *op. cit.*, p. 623, is polygamous.

“It is in the month of September, after the third or fourth moult, that the males appear, but only few in number. The author says that it was with much trouble that he found four or five of them among a great quantity of females. More slender than these, they are also more active; they run with their wings elevated from one female to another, and confer their favours according to their caprice. After some days of such a course, the male retires to the root of a plant, under a stone, where its inactive body becomes covered all over with a very fine cottony matter, which has very much the appearance of mouldiness, and there, doubtless, it dies. The females have one moult after coupling, they soon after retire into the

earth, or to protection under stones, appearing on fine days during winter, and thus pass their life without making much growth. When spring comes, they regain their vigour, and then is formed on their hinder part the singular cradle which receives their numerous family. They lay their eggs, and live languidly for more than a month afterwards."

I have never captured or had the male, which it appears is only to be found in the autumn, and although it seems certain that but comparatively few of this sex are developed, yet it may be possible to obtain some by rearing them from the larvæ. The male larvæ, according to Signoret, may be distinguished by the two caudal lamellæ being narrow; by the long, stout, first joint of the antennæ, and the still longer terminal joint (the very peculiar form of the antennæ being altogether abnormal in this family); and by the conjoined tibia and tarsus on all the legs. This *Orthezia* is not scarce in the larva-state, in August and September, in many places, on various plants, and there is, therefore, an opportunity for some of our aspirants to obtain and rear some males to maturity; the history of the last changes would form an extremely interesting article; and the same may be said, in an even greater degree, of the other species.

In the Trans. Ent. Soc. London, N. S., iv, Proceed., p. 5 (1856), is a very interesting and humorous account, by the late Edward Newman, of the birth and infantile life of a brood of *O. characias*, derived from a female that I had given to him early in June.

The generic name *Orthesia*, given by Bosc, in 1784, in honour of the Abbot of Orthez (l'abbé d'Orthez—not Dorthez, as has been stated), was altered in 1785, by the Abbé himself to "*Dorthesia*," which was adopted by Latreille and others, but this not being correct, according to orthographic rule, the original name was restored by Amyot and Serville, written, however, *Orthezia*, as according better with its derivation.

8, Beaufort Gardens, Lewisham :

20th November, 1880.

Note on the food of Bothynotus pilosus.—It would seem from the editorial note (p. 165) that the supposed food-plant of this species is spruce fir. Such was certainly not the case with my specimens. They were females with undeveloped wings, and there is no coniferous tree or shrub within a considerable distance of the locality in which they were taken.

The underwood around the sand-pit consists of oak, hazel, and birch, with some broom at a little distance. I do not know whether any of these are likely to be the food-plant.—E. N. BLOOMFIELD, Guestling Rectory : December 11th, 1880.

THE OCCURRENCE IN HEREFORDSHIRE OF *PEMPELIA HOSTILIS*,
WITH DESCRIPTION OF THE LARVA.

BY JOHN H. WOOD, M.B., AND W. BUCKLER.

I was fortunate enough, last June, to breed three specimens of this rare insect, a species that has not, I believe, been taken in this country for many years.

The larvæ were met with somewhat accidentally. I was hunting one day in the middle of September, 1879, among underwood, for larvæ of the *Closteræ*, when I caught sight of a few strands of silk spun from a brown curled aspen leaf to a living green one. On picking the dead leaf and uncurling it, I saw exposed on its surface a silken tube, at once suggestive of the work of a knothorn, and this supposition became almost a certainty, when the little grey larva, after some persuasion, was prevailed on to show itself. For the rest of the afternoon I had, as may be supposed, eyes for nothing but dead or dying aspen leaves, and the result was two more nests. I call them nests, because I subsequently found that with one exception, in which instance only a single larva was present, the leaves were occupied by two or even three larvæ living together, each in its own gallery, but with the galleries closely joining or even interlacing. The larvæ at this time were very young, and considering the choice they had made (in the one case of a dead leaf, in the other two of the old tenements of other larvæ), might readily have been overlooked; but it was quite a different matter when I found, later in the month, a fourth nest containing two nearly full grown larvæ. As in the others, so there was here, the nucleus of two half dead yellow leaves, but from these were stretching in all directions bands of silk to the adjacent fresh ones, which had been freely eaten, drawing them together and thus making a large and conspicuous object. I sent Mr. Buckler two of the larvæ, and am greatly indebted to his kindness for the description of them given below; unfortunately, both proved to be stung. Mine, when full fed, left their nests. They spun up (four of them) in rolls of paper, and changed to pupæ at once. Being anxious to see the moth, I forced one early in the spring, and was punished with a very bad cripple; the others left to themselves produced fine specimens in June.

The question arises—which selects the site of the nest? Does the parent moth lay her eggs on these old leaves, or do the larvæ wander about till they find them? In favour of the former is the fact, that more than one larva is generally present; nevertheless, I am inclined to think that the latter is the correct view, since the exer-

cise of such a choice seems to fit in better with larval instincts than with those of the perfect state; and, moreover, there was certainly, in one instance, a marked difference in the sizes of two larvæ feeding together.—JOHN H. WOOD.

Tarrington, Ledbury :
22nd November, 1880.

On September 23rd, 1879, Dr. Wood kindly sent me two larvæ of *Pempelia hostilis*, each between two leaves of *Populus tremula*, spun together with silk, to which quantities of frass were adhering.

One larva was full grown, the other quite small and preparing to moult, three-eighths of an inch in length and very slender, with blackish head and collar plates, light pinkish-drab body with dorsal stripe just a tint darker, and having on either side of the back two cream-coloured lines, and along the spiracular region two paler cream-coloured stripes, the lowest slanting downwards just at the end of each segment throughout its course, the ground colour between these and also of the belly paler than that of the back and sides: after moulting on the 26th, it assumed the colour of the full grown example, though it refused to feed, and in course of a day or two a parasitic larva ate its way out, which proved fatal to the unlucky victim, whose shrivelled-up skin alone remained.

The full grown larva measures nearly three-quarters of an inch in length, of moderate slenderness, the head broad and full, about as wide as the second segment, the body tapering behind from the tenth to the end of the thirteenth, the thoracic segments deeply wrinkled, the others with a deep transverse wrinkle a little beyond the middle, the ventral and anal legs short and much beneath the body; the rather shining head is blackish-brown, having a broad ochreous stripe on the crown of each lobe and a streak above the mouth, papillæ black, finely ringed with white; the ground colour of the body is a dingy blackish-olivaceous-brown, darkest on the anal flap, rather glistening on the second segment, but quite dull on the rest of the body, two fine black lines on the collar change from thence to a plain dorsal stripe, rather darker than the ground colour as far as the last segment, where it is black; continuous from either lobe of the head is a broad sub-dorsal ochreous stripe on the second segment, opening out beyond in two lines which, after passing the thoracic segments, become more dingy and somewhat greyish-ochreous, and show but faintly; midway along the side occurs the faintest possible trace of an extra line, thin and indistinct, a sub-spiracular stripe begins on the third segment and

continues of a dirty whitish colour just above the legs to the end of the thirteenth, having a fine line of the ground colour running through below; the minute round spiracles are of the ground colour, finely ringed with darker, the tubercular dots very small, blackish-brown, and slightly glistening, each with a fine hair; the ocellated spot on either side of the third and twelfth segments is of the ground colour, ringed with black, and with a minute black centre bearing an extra long hair; the anterior legs black, the ventral and anal legs of the ground colour. This individual produced an ichneumon on the 25th of June, 1880.—W. M. BUCKLER.

Emsworth:

13th November, 1880.

[The re-discovery of this species, the genuine *Phycita hostilis* of Stephens, is of considerable interest. The only recent (probable) record upon which I can put my hand, is at vol. iv, p. 152, of this Magazine, when the late Rev. E. Horton recorded the rearing of a specimen of a *Phycis adelphella* in the year 1860, from a larva found feeding on aspen, near Worcester, and gave a short description of the larva.

The name *hostilis*, Steph., had before that time been superseded in favour of *adelphella*, Fisch., by Mr. Doubleday in his catalogue, but, apparently, without sufficient reason, supposing the species to be *identical*, for Stephens' description, published in 1834, is probably anterior to that of Fischer von Röslerstamm, 1834 to 1843. I also think that Mr. Doubleday must have relied upon a *description* of *adelphella*, and not on a comparison of the insects themselves.

Some years ago Professor Zeller, who had also described *adelphella* in the Isis (1846), sent me a type from Silesia, and as Dr. Wood has kindly allowed me to examine one of his specimens, I am able to record the result.

Adelphella (from Zeller) is rather like *formosa*, Haw., but with narrower fore-wings, the costa being regularly curved, the base of fore-wings brick-red, bounded by a broad, *oblique*, curved, blackish, cloudy fascia, which includes the first line, double, twice angulated, black with a white line between. The remainder of the wing clouded with dark grey, except an ill-defined brick-red blotch along the dorsal margin. Second line double, sinuous, placed far back but very distinct in the cloudy-grey ground colour, central dot also very indistinct. Hind-wings pale grey.

Stephens' description of *hostilis* is as follows: "Anterior wings brownish, with the base somewhat ferruginous and immaculate; this space is followed by a broadish, waved, fuscous or black fascia, in which is a pale streak; towards the hinder margin is a second dark fascia, in which is a distinct waved pale streak, slightly angulated towards the inner margin; the space between them is slightly clouded, and bears a brown lunule towards the costa; on the hinder margin is an interrupted fuscous line; cilia brownish; posterior wings fuscous, cilia paler, shining, with a dark line at the base.

"I have a specimen of this very distinct species, which a little resembles the foregoing [*pinguis*] which I took at Darenth Wood in June many years since, and another found at Ripley in 1827."—Illustr. Haust., iv., p. 307.

With this description of *hostilis* Dr. Wood's specimen agrees most accurately,

and the general resemblance to *pinguis* is striking, especially in the *breadth* of the fore-wings, while it actually bears no resemblance to the narrow winged *adelphella*. The "ferruginous" basal space in the first is nothing like the brick-red blotch of the other, and the blackish fascia by which it is bounded is comparatively upright in the former, while it is curved and very oblique in the latter.

I am, therefore, perfectly satisfied that *hostilis*, Stephens, is altogether distinct from *adelphella* of Zeller, and probably of F. v. R., and I think, then, there is no reason to suppose that it has ever been found in the United Kingdom. Dr. Wocke (who adopts *hostilis* as the prior name, and *adelphella* as a synonym) gives Britain, Germany, and Southern and Eastern Russia as localities. The former refers to *hostilis*, the latter doubtless to *adelphella*.—C. G. BARRETT.]

ON PARTHENOGENESIS IN *TENTHREDINIDÆ*.

BY J. E. FLETCHER.

During the past season I have, as opportunity offered, continued my experiments on this subject. Thirteen virgin ♀ belonging to six species were tried, but the names of two of the species are not yet determined. They all have the power of depositing fertile ova. I notice that the virgin ♀ of the green *Nemati* deposit only a small number of eggs. So far, I have bred only one ♀ from any parthenogenetic brood of saw-fly larvæ.

A virgin ♀ of *Phyllotoma vagans* deposited between sixty and seventy eggs, but as they were distributed on only three leaves, the larvæ could not feed up. They ate all the parenchyma, and some bored down the footstalks, but then, of necessity, perished. One leaf contained nearly forty larvæ.

A specimen of *Eriocampa ovata*, from a this year's larva, emerged on August 30th; she deposited about thirty ova, from which the larvæ hatched and fed, but not vigorously, till the food plant began to lose its vitality. Eventually, all perished for lack of food.

A specimen of *Hemichroa rufa*, bred August 15th, deposited ova, from which I obtained about forty larvæ; but the stormy weather of autumn proved very unfavourable to larvæ confined in a net, and when I decided to feed them indoors, they were reduced to about twenty, about a dozen of which have spun up.

A small brood of larvæ from a virgin ♀ of *Nematus curtispina*, bred August 17th, spun up by September 20th, and three ♂ were bred by September 30th.

Happy Land, Worcester :
November, 1880.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

III. LEPIDOPTERA.

BY DR. O. STAUDINGER.

The *Macro-Lepidoptera* collected by the Rev. A. E. Eaton in 1880 are represented by 44 good species of *Rhopalocera*, and 26 of *Heterocera*, 23 of the latter being *Geometræ*.

RHOPALOCERA.

PAPILIONIDÆ.

Papilio Podalirius, L., var. *Feisthamelii*, Dup.—A solitary bad specimen, captured April 29th, along the main stream below Cintra.

Thais Rumina, L.—A single specimen, with no indication of date or locality of capture.

PIERIDÆ.

Pieris brassicæ, L.—May 17th, near Silves.

Pieris napi, L.—April 27th, near Cintra, and June 8th at Cea.

Pieris Daplidice, L.—One indifferent specimen, captured June 3rd, between Coimbra and São Antonio.

Anthocharis Belemia, Esper, var. *Glaucæ*, Hüb.—One specimen, May 8th, near Almodovar.

Anthocharis cardamines, L.—One specimen, April 29th, along the main stream below Cintra.

Leucophasia sinapis, L.—One specimen, April 27th, near Cintra.

Colias Edusa, Fab.—One specimen, May 18th, between Silves and Monchique. A specimen of the aberration *Helice*, Hüb., June 4th, near Cea.

Rhodocera rhamni, L.—Several specimens, April 29th, near Cintra, and June 9th, between Cea and São Romão.

Rhodocera Cleopatra, L.—One specimen, May 17th, near Silves.

LYCÆNIDÆ.

Thecla spini, Schiffermiller.—Two specimens, May 17th, near Silves.

Thecla ilicis, Esper, var. *Esculi*, Hüb.—Two specimens, May 17th, near Silves.

Thecla roboris, Esper.—Two specimens, June 12th, at Ponte de Morcellos.

Thecla rubi, L.—A single very worn specimen, with no indication of date or locality.

Polyommatus Alciphron, Rottenberg, var. *Gordius*, Sulzer.—One specimen, June 22nd, near Villa Real.

Polyommatus Phlæas, L.—Several specimens at Cintra, end of April and May 13th, between São Barnabe and São Bartholomeu do Messines.

Lycæna Bætica, L.—One bad specimen, June 6th, at Cea.

Lycæna Telicanus, Lang.—One specimen, June 8th, at Cea.

Lycæna Ægon, Schiffermiller.—Several specimens, June 3rd, between Coimbra and São Antonio; June 8th, at Cea; and June 14th, near Ponte de Morcellos.

Lycæna Icarus, Rottenberg (*Alexis*).—Several specimens at Cintra, end of April; one specimen of the aberration *Icarinus*, Scriba, April 28th, near Cintra.

Lycæna Bellargus, Rottenberg.—One specimen in very poor condition, May 22nd, near Alferce.

Lycæna Argiolus, L.—One specimen, April 29th, near Cintra.

Lycæna semiargus, Rottenberg (*Acis*).—One specimen, June 5th, near São Romão.

Lycæna melanops, Boisduval.—Two specimens, June 25th, near Villa Real.

NYMPHALIDÆ.

Vanessa c-album, L.—One specimen, June 3rd, between Coimbra and São Antonio.

Melitæa aurinia, Rottenberg (*Artemis*), var. *Desfontainii*, Godart.—Several specimens, April 28th, near Cintra; May 19th, near Monchique; June 5th, near São Romão; and June 8th, near Cea.

Melitæa Phæbe, Knoch, var. *occitanica*, Staudinger.—Several specimens, June 24th, near Villa Real.

Melitæa didyma, Ochsenh., var. *occidentalis*, Staudinger.—Several specimens, June 13th, at Ponte de Morcellos, and June 23rd, near Villa Real.

SATYRIDÆ.

Melanargia Lachesis, Hüb.—Several specimens, June 14th, near Ponte de Morcellos.

Melanargia Ines, Hoffmannsegg.—Several specimens, May 18th, near Monchique, and June 3rd, between Coimbra and São Antonio.

Satyrus Semele, L.—One specimen, June 30th, near Salamonde.

Pararge Megæra, L.—Two specimens, April 27th, near Cintra, and June 7th, near Sabugueiro.

Pararge Ægeria, L.—Several specimens, April 28th, near Cintra, and June 3rd, between Coimbra and São Antonio.

Epinephile Janira, L.—Several specimens, June 14th, near Ponte de Morcellos; of the variety *Hispulla*, Hüb., several were captured May 15th and 17th, near Silves.

Epinephile Ida, Esper.—Five specimens, June 12th, near Ponte de Morcellos.

Epinephile Pasiphaë, Esper.—Several specimens, May 18th, near Monchique, and June 3rd, between Coimbra and São Antonio.

Cænonympha pamphilus, L.—Two specimens, May 5th, between Casevel and Almodovar, and May 21st, near Monchique. They are a dark variety, but not the *var. Lyllus*, Esper.

HESPERIDÆ.

Spilothyrus alceæ, Esper.—One specimen, June 7th, near Sabugueiro.

Syrichthus Proto, Esper.—One specimen, May 17th, near Silves.

Syrichthus Alveus, Hüb., *var. onopordi*, Ramb.—One specimen, May 17th, near Silves.

Syrichthus Sao, Hüb., *var. Eucrate*, Ochsenh.—Two specimens, end of April, near Cintra.

Hesperia lineola, Ochsenh.—Two specimens, a male, June 3rd, between Coimbra and São Antonio, a female, June 24th, near Villa Real.

HETEROCERA.

SPHINGES.

SESIIDÆ.

Sesia affinis, Staudinger.—Two specimens, June 24th, near Villa Real.

BOMBYCES.

ARCTIIDÆ.

Euchelia jacobææ, L.—One specimen, much wasted, May 23rd, near São Marcos da Serra.

NOCTUÆ.

Euclidia glyphica, L.—One specimen, much worn, June 7th, near Sabugueiro.

GEOMETRÆ.

Nemoria porrinata, Zeller.—One specimen, June 30th, near Salamonde.

Acidalia camparia, H.-S.—One specimen, April 24th, near Olivaes, in the vicinity of Lisbon.

Acidalia nexata, Hüb.—Two specimens, May 10th, near Almodovar.

Acidalia virgularia, Hüb.—One specimen, April 23rd, near Lisbon, one, June 12th, near Ponte de Morcellos.

Acidalia rubiginata, Hufn. (*rubricata*) var. ?—One specimen, in bad condition, is perhaps referable to this species; captured June 25th, near Villa Real. I have not seen this insect from Spain.

Zonosoma pupillaria, Hüb.—One specimen, May 16th, near Silves.

Pellonia sicanaria, Zeller.—Several specimens, June 3rd, between Coimbra and São Antonio.

Hemerophila nycthemeraria, H.-G.—One specimen, May 23rd, near São Marcos da Serra. This species was previously only known from Switzerland.

Boarmia gemmaria, Brahm (*rhomboidaria*).—One specimen, May 20th, on the slopes of Picota, near Monchique.

Gnophos respersaria, Hüb.—One specimen, May 16th, near Silves.

Gnophos asperaria, Hüb., ab. *pityata*, Rambur.—One specimen, June 12th, near Ponte de Morcellos.

Anthometra plumularia, Boisd.—One specimen, June 12th, near Ponte de Morcellos.

Fidonia famula, Esper.—One specimen, June 9th, between Cea and São Romão.

Athroolopha pennigeraria, Hüb.—One specimen, June 30th, near Salamonde.

Halia vincularia, Hüb.—One specimen, June 12th, near Ponte de Morcellos.

Halia gesticularia, Hüb.—One specimen, early in May, at Almodovar.

Aspilates ochrearia, Rossi (*citraria*).—Two specimens, May 8th, at Almodovar, and May 20th, on the slopes of Picota, near Monchique.

Lythria sanguinaria, Duponch.—One specimen, June 24th, near Villa Real.

Ortholitha limitata, Scop. (*mensuraria*).—One specimen, June 14th, near Ponte de Morcellos.

Cidaria bilineata, L.—One specimen, June 3rd, between Coimbra and São Antonio.

Eupithecia oblongata, Thunberg (*centaureata*).—One specimen, June 11th, near Cea.

Eupithecia pumilata, Hüb.—One specimen, April 27th, Cintra.

N.B.—There is one other specimen of the genus *Eupithecia*, but in too bad condition to be determined; it was taken May 10th, near Aldea do Neves.

AUSTRALIAN GALL-MAKING LEPIDOPTEROUS LARVÆ.

BY E. MEYRICK.

In relation to the subject of Mr. McLachlan's paper in the December number of this Magazine, I may add, that I have found at least three Lepidopterous gall-producing larvæ in Australia, as follows :

1. Larvæ producing a terminal gall on the extremity of the shoots of an *Eucalyptus*, near Sydney ; this gall is an inch or more in length, and has all the appearance of an inflated but unexpanded tuft of leaves, but is a true gall ; these larvæ are solitary ; they produced a species of *Tortricidæ*, at present undescribed.

2. Larvæ producing a swollen gall in the stem of young shoots of an *Eucalyptus*, near Sydney ; these I have not yet bred.

3. Larvæ producing a large shapeless roundish gall on a phyllo-dineous *Acacia*, near Brisbane ; this gall is sometimes as large as two fists, and contains numerous larvæ, becoming riddled with galleries ; it may be taken to represent a cluster of leaves ; these larvæ produced one of the *Pyrilidina*, described by Walker as *Pyrilis ægusalis*, though it appears to belong rather to the *Botydæ*. It is distressing that Walker should not have been able to produce a less abnormally compounded specific name.

Ramsbury, Hungerford :

December 7th, 1880.

An addition to the British Trichoptera.—At the last Meeting of the Glasgow Natural History Society, I exhibited specimens of *Molanna palpata*, McLach., a species of caddis-fly new to Britain. It has hitherto been known only from Finland and Siberia, and a specimen from St. Petersburg was found among Kolenati's types of *M. angustata* in the Vienna Museum.

The remarkable form of the third joint of the maxillary palpi in both sexes, at once distinguishes it from its congeners.

The above species was taken during my stay last summer at Cannich, Strathglass, Inverness-shire, and occurred commonly all through August ; it was the common caddis-fly at all parts of the Strath visited by me.

I found it along the margins of lochs by brushing the overhanging heather, &c., and cannot remember having seen it flying without having been disturbed.

M. angustata, Curtis, is the only other British species of the genus.—JAMES J. KING, 267, Sauchiehall Street, Glasgow : December, 1880.

Abundance of Clothilla picea, Motsch.—Mr. E. A. Butler of Hastings, has just sent me a supply of this curious little black species of *Psocidæ*. He says they have been familiar to him for years, as occurring in neglected boxes. Now he finds them chiefly in an old collection of plants that had fallen into decay, and in some marine specimens that had not been properly cleaned. The insects are of varying sizes, and

some of them possess wing-scales, indicating complete development. I had previously seen only single examples, and generally they came from boxes of foreign insects. The boxes in which they came (alive) to me have been committed to the flames, so as to avoid a possible addition to the Fauna of my collections.—R. McLACHLAN, Lewisham: *November 27th*, 1880.

On the metamorphoses of Blepharoceridæ.—As an addition to Baron Osten-Sacken's communication (*ante* p. 130) on Dr. Fritz Müller's discovery of the metamorphoses of *Blepharoceridæ*, I beg to call the attention of Dipterologists to my report on the same subject in Carus's *Zoologischer Anzeiger*, No. 51, April, 1880, p. 134. It treats on the metamorphoses of the European *Blepharocera fasciata*, both sexes of which, according to Prof. Mik's discovery of the ♂, have the eyes close to each other, of which Baron Osten-Sacken convinced himself at Vienna, but has forgotten to point it out in his notice.—F. BRAUER, Vienna: *Nov. 27th*, 1880.

A colony of Ptinella denticollis in Warwickshire.—A short time ago I found an example of the rather uncommon *Ptinella denticollis*, at Solihull near here, and which was kindly determined for me by the Rev. A. Matthews. This led me to engage in a systematic hunt for the species, in which I have been very successful. Under dead bark at Knowle, I recently discovered quite a large colony of this little beetle, some two hundred specimens of which I have captured without apparently diminishing their numbers. Both males and females occurred, the latter being, as usual, the least abundant.—W. G. BLATCH, Green Lane, Smallheath, near Birmingham: *November 20th*, 1880.

Capture of Sitaris muralis in the nest of Bombus terrestris.—In August last in a nest of *Bombus terrestris*, having its entrance in a wall supporting the earth on one side of a road, cut in the side of a hill, near Woodchester Park, Gloucester, I found an imago of *Sitaris muralis*. As there were also several strange looking larvæ in the nest I took it home, unfortunately I was unable to watch them, and only one other *Sitaris* developed, the others all died.—H. SEBASTIAN B. GATES, Dominican Priory, Woodchester: *December*, 1880.

Larvæ of Acronycta alni at Bristol.—It may be interesting to some of your readers to know, that about the second week of July last, I found two larvæ of *Acronycta alni* in our garden, on some French beans, but I have little doubt that they fell from an apple tree that overhung the beans. One was in very good condition, fresh and beautifully coloured; the other had several of the horseshair-like appendages broken off; and the stripes on each segment, instead of being (as in the other) yellow, were a dingy white. The first died soon after I captured it (neither of them fed while I had them), but the other changed to pupa, and is I think free from ichneumon.—PHILIP GRAY, 20, Arley Hill, Bristol: *December 4th*, 1880.

P.S.—This species, I am given to understand, has been found before in Bristol, but very rarely.—P. G.

An additional food-plant for Laverna epilobiella, Römer.—In July last, I met with four larvæ of this insect feeding on *Epilobium montanum*. One moth was bred in the beginning of August: the others, having escaped or died.—J. E. FLETCHER, Happy Land, Worcester: *November*, 1880.

Unseasonable weather: Lepidoptera in December.—After some sharp weather in November (sent doubtless for the benefit of the Geraniums and Tropæolums in the garden), we are having, in Pembrokeshire, what can only jocularly be called winter.

On the 3rd inst., when starting on a journey in the morning twilight, a moth came fluttering down from the trees and alighted on the ground. It proved to be *Cidaria russata* in perfect condition—evidently just emerged—but sufficiently smaller than usual to prove it a *third*-brood specimen, forced by the mildness of the season. On the 4th, *Vanessa urticæ* was flying briskly along the streets and over the houses at Pembroke Dock, and on the night of the 5th, *Scopula ferrugalis* came to light at my window. All these were casually noticed, without any attempt at collecting or searching.—CHARLES G. BARRETT, Pembroke: *December 9th, 1880.*

Reviews.

AVIS PRÉLIMINAIRE D'UNE NOUVELLE CLASSIFICATION DE LA FAMILLE DES DYTISCIDÆ, par D. SHARP. Extrait des Comptes-rendus de la Société Entomologique de Belgique, Séance du 4 Septembre, 1880. Bruxelles: 8vo, pp. 5.

We have received from our old and valued correspondent, Dr. Sharp, a copy of this important outline of the scheme of the larger work upon *Dytiscidæ* on which he has been occupied for some six years; and we willingly give it all the publicity in our power, though regretting that such original matter by a British writer should not have, in the first instance, found a place in some English publication.

This outline is constructed somewhat on the plan of inverting the usually accepted arrangement of things, which the author originally adopted in a discussion of the terms genus and species; and ordinary readers will, by turning to the last page, obtain a readier view of the larger aims of the author.

The great family of *Dytiscidæ* is divided into two series: the first, *Dytisci fragmentati*,—the second, *Dytisci complicati*. No precise explanation is given for these terms, but corresponding series are stated to occur in the *Carabidæ*, the first of which is equally "fragmentary," both "fragmentary" series having in common the same structure of the articulating cavities of the intermediate legs, the outer side of which is composed by parts of three principal pieces of the skeleton. But the *Carabici complicati* and *Dytisci complicati* are opposed to the two "fragmentary and central" series in the fact of only two pieces forming the outer edge of the intermediate cotyloid cavity in the former, whilst four pieces contribute to its formation in the latter. And the *Dytisci complicati* are distinguished from all other beetles by their metathoracic episternum penetrating to the intermediate cotyloid cavity.

Following Thomson and Le Conte, the *Halipilides* are excluded altogether, and it is left for students of *Carabidæ* to decide if they are to be ranged in the latter group or form a separate one. *Pelobius* is only admitted by conventional right; it is intermediate between the *Carabidæ* and *Dytiscidæ*, with a predominance of the external structure of the former, and is put at the head of the latter, but with no hint of any group for its reception. The DYTISCI FRAGMENTATI are composed of (presumably) *Pelobius*; a tribe *Noterides*, composed of two genera, *Notomicrus* and *Hydrocoptus*, and also of three groups, *Noterini*, *Suphisini*, and *Hydrocanthini* (which three are formed of the genera *Pronoterus*, *Synchortus*, *Noterus*, *Colpius*,

Suphis, *Canthydrus*, and *Hydrocanthus*); and two other groups, *Vatellini* (gen. *Macrovatellus*, *Vatellus*, and *Derovatellus*) and *Laccophilini* (gen. *Laccophilus* and *Neptosternus*).

The DYTISCI COMPLICATI are composed of two isolated and separate genera, three tribes, and two groups. They commence with *Amphizoa* (so that the family character of the possession of natatorial legs must be set aside), followed by the tribe *Hydroporides*, made up of three groups, *Hydrovatini* (gen. *Hydrovatus* and *Queda*), *Bidessini* (gen. *Heterhydrus*, *Pachydrus*, *Desmopachria*, *Bidessus*, "*Huxelhydrus*," and *Tyndalhydrus*), and *Hyphydrini* (gen. *Andex*, *Hydropeplus*, *Primospes*, *Cælydrus*, *Darwinhydrus*, and *Hyphydrus*); an isolated genus, *Sternopriscus*; another group, *Hydroporini* (gen. *Hyphoporus*, *Paroster*, *Herophydrus*, *Cælambus*, *Chostonectes*, *Antiporus*, *Necterosoma*, *Macroporus*, *Deronectes*, and *Hydroporus*); and another isolated genus, *Celina*. Between the tribe *Hydroporides* and the next tribe, *Colymbetides*, intervenes another isolated genus, *Methles*. The *Colymbetides* are composed of the groups *Agabini* (gen. *Hydrotrupes*, *Metronectes*, *Agabus*, *Ilybiosoma*, *Platynectes*, *Leuronectes*, *Agametrus*, *Agabinus*, *Platambus*, and *Ilybius*) and *Colymbetini* (gen. *Scutopterus*, *Rhantus*, *Colymbetes*, and *Meladema*), between which are placed the following seven genera, distinguished from both of them by negative characters, insufficient to form a natural separate division, viz., *Copelatus*, *Aglymbus*, *Lacconectus*, *Agabetes*, *Matus*, *Coptotomus*, and *Lancetes*.

Then comes a separate group, *Dytiscini* (gen. *Hyderodes* and *Dytiscus*), followed by a tribe, *Hydaticides*, composed of two groups, *Hydaticini* (gen. *Prodaticus* and *Hydaticus*), and *Thermonectini* (gen. *Acilius*, *Thermonectes*, *Æthionectes*, *Sandracottus*, *Rhantaticus*, and *Graphoderes*), and an isolated genus, *Eretes*. The series concludes with another separate group, *Cybistrini* (gen. *Spencerhydrus*, *Homœodytes*, *Megadytes*, and *Cybister*).

In this string of names, there is insufficient material to attempt useful criticism. Dr. Sharp's entomological acumen has been proved too often for any one to doubt that his earnest and long continued study has justified the, at first sight, unbalanced arrangement of tribes, genera, groups, &c.; and his book will, doubtless, make all this clear, even to the swallowing of *Amphizoa*, after straining in vain at *Haliplus*. As regards the names themselves, it can only be suggested that some of the new ones are constructed on the principle of language being given us to conceal our thoughts. We are aware, from former communications, that Dr. Sharp does not attribute to the construction of mere words, and such minor things, the importance hitherto bestowed upon them by his predecessors and fellow-workers; and it is more than probable that the most egregious of the horrors that he now proposes are brought forward merely to show his contempt for nomenclators.

THE YOUNG NATURALIST: an illustrated penny weekly Magazine of Natural History; conducted by J. E. ROBSON and S. L. MOSLEY. Huddersfield: Preston Brothers; London: J. Kempster and Co. Vol. i, 1880.

To a certain extent, this periodical is based upon the plan of the "*Intelligencer*," but extended to all branches of Natural History. It is apparently published both in weekly numbers and monthly parts. We have before us part xii, for November, 1880.

It appears likely to prove very useful, if care be taken not to identify it with a

special class of collectors. The illustrations, although rough, will, no doubt, prove attractive to juveniles, and the editorial "leaders" sometimes contain sound information and advice. The weak point is the careless correcting for the press, especially apparent in the entomological portion. In this, and in some other respects, the conductors should more closely follow the example set by the French Journal, the "Feuille des Jeunes Naturalistes," to which, amongst contemporaries, the "Young Naturalist" offers the greatest amount of resemblance.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS; second series, Part ix. Boston: Houghton, Mifflin, & Co.; London: Trübner & Co. 1880.

This Part entirely concerns three species of *Papilio*, viz.: *P. Oregonia*, Edwards (much like our *Machaon*), formerly considered a variety of *Hippocrates*, but now described and figured as distinct; *P. brevicauda*, Saunders, the perfect insect of which, having been previously figured, is not further alluded to, but there is a most elaborate series of figures of the transformations, with a detailed account of the habits, as observed by Mr. Mead, in Newfoundland; and *P. Bairdii*, Edwards, which recalls *Asterias*, but is much darker. As usual, the letter-press is very full, and the plates are above praise.

Obituary.

Étienne Mulsant.—Another of the "heroes" of our Science has passed away. Étienne Mulsant, the veteran Entomologist of Lyons, died on November 4th, 1880, at the age of 83, having been born on the 2nd March, 1797, at Mornant, Département du Rhône. For the space of half-a-century this distinguished author has occupied a leading place in the Entomological world, his earliest production bearing the date of 1830, and having for its title "Lettres à Julie sur l'Entomologie, suivies d'une description méthodique de la plus grande partie des insectes de France; ornées de planches (15 in number) dessinées et gravées par MM. Louvain et Duménil." 2 vols. 8vo. Lyons and Paris, 1830. In this work the author slightly sketched the characters and habits of the different families of insects (interspersed with fragments of poetry of his own composition), in the shape of a series of letters originally written for the use of the young lady who subsequently became his wife, to whom the work was dedicated, when finished and published after their marriage. This dedication is a fair specimen of his poetical talents, and is here reproduced.

À MA FEMME.

Tandis que loin de ta présence
J'attendais le moment heureux
Ou ta main, promise à mes vœux,
Devait couronner ma constance
Pour charmer ces trop longs instans,
J'aimais de l'Entomologie
À t'enseigner les élémens,
Cette occupation chérie
Enchantait mon cœur et mes goûts;
Aujourd'hui qu'un titre plus doux
À mon âme te rend plus chère
Je devrais, trop heureux époux,
Goûter mon bonheur et me taire;
Mais, tu l'ordonnes, pour te plaire
Je livre au hasard ces récits,

Produits légers de ma jeunesse,
Qui sans effort de ma paresse
Pour toi seul furent écrits
Plus d'un succès leur est promis,
Si dans leur publique existence
Ils retrouvent ta bienvieillance
Ton accueil pour moi si flatteur;
Mais si la critique ennemie
Les accable d'un trait vengeur,
À l'oubli consacrant ma vie
Je saurai près de toi, Julie,
Me consoler de sa rigueur.
Qui te connaît, à mon bonheur
Pourrait encore porter envie.

This labour of love, as it may well be called, was followed by a "Cours d'Entomologie réduit en tableaux synoptiques : à l'usage des ecoles." Lyons. 8vo. 1833. And five years subsequently appeared the first of a long series of Memoirs, chiefly on various families of *Coleoptera*, published from time to time in the "Annales de la Société d'Agriculture" of Lyons : in the "Annales de la Société Linnéenne" of Lyons ; and in the "Mémoires de l'Académie des Sciences" of Lyons.

Of these various Memoirs and his other works, the list given by Dr. Hagen in his "Bibliotheca Entomologica," up to the year 1861, is not fewer than 148 ; since which period the number has been greatly increased ; the Annual Summaries of Entomological publications in the German "Bericht," and in our own "Zoological Record," rarely failing to announce fresh works by him, associated with M. Rey, and other French Coleopterists. The most important of these detached Memoirs are descriptive of the *Coleoptera* of France, occupying thirty-one volumes large 8vo, commencing with the Longicorn beetles in 1839, occupying 304 pages, with 3 plates, and terminating with the 9th volume of the *Brevipennes* or *Brachelytra*, published in 1879. His "Histoire Naturelle des Punaises de France" occupies 3 volumes 8vo. Many of his shorter Memoirs were collected together and published separately under the title of "Opuscules Entomologiques," in 14 volumes 8vo ; whilst a more extended and general Monograph of the *Coccinellidæ*, in 2 large volumes 8vo, was published in 1852 and 1853, under the title "Species des Coléoptères trimères securipalpes." To this work large numbers of exotic species were contributed by Mr. Hope, and the type specimens, bearing the MS. names of the author, now enrich the Collection under my charge at Oxford.

In addition to his Entomological works, M. Mulsant also published an elementary series of works on Natural History, in which he described "les applications de cette science aux diverses connaissances utiles et offrant la réponse aux questions du programme universitaire," devoting one volume to each of the sciences Zoology, Physiology, Geology and Botany. He also published a companion volume of "Lettres à Julie sur l'Ornithologie," in one large volume, with figures ; also a beautiful work on Humming-Birds, in which many new species of these lovely creatures were represented with great skill : he likewise found time to publish a charming work, entitled "Souvenirs du mont Pilat et de ses environs," in 2 volumes 8vo, and a number of bibliographical notices of deceased Naturalists in the Annales of the Lyons Académie.

M. Mulsant was the President of the Linnean Society of Lyons, Bibliothécaire-adjoint of the fine Library belonging to the University of Lyons ; he was also Professor of Natural History, and "Correspondant du Ministère de l'Instruction Publique."—J. O. WESTWOOD.

THE BELGIAN ENTOMOLOGICAL SOCIETY.—The celebration of the 25th Anniversary of this Society took place at Brussels, on the 16th October, when an address was delivered by M. Weinmann, the President, and an instructive sketch of the history and prospects of the Society was read by the Secretary, M. Preudhomme de Borre. Baron de Selys-Longchamps, the first President, to whom the Society owes so much of its success, was unanimously elected Honorary President.

AN ANNOUNCEMENT OF NEW GENERA OF THE *EPHEMERIDÆ*.

BY THE REV. A. E. EATON, M.A.

Names for some new genera being required in the lettering of plates to illustrate my forthcoming work on the *Ephemeridæ*, I am anxious to establish them. It will be sufficient to characterize the genera concisely, reserving detailed descriptions of them for the contemplated monograph. The admeasurements given in the descriptions of genera, though exact, should, for all practical purposes, be regarded as only approximate: they are only necessary in the absence of illustrations.

ELASSONEURIA, *n. g.*

Allied to *Oligoneuria*. Wing-membrane dull or satin-like; fore-wing with three longitudinal nervures, of which the hinder two are forked, and with a short, free, epinotal prolongation of the membrane at the wing-roots. Caudal setæ of ♀ 3, subequal to one another and about one-third as long as the body. Type, *E. Trimeniana* (in *Oligoneuria*), McLach. Distrib., S. Africa.

SPANIOPHLEBIA, *n. g.*

Allied to *Lachlania*. Wing-membrane clear neutral tint, "shot" with blue; fore-wing with five or six obvious longitudinal nervures, of which the hinder two are forked (the pabrachial deeply so), also with several series of cross-veinlets disposed transversely, and with a short free prolongation of the membrane at the peak of the mesonotum. Fore-tibia of ♂ about as long as the femur; 1st tarsal joint longer than the next. Caudal setæ 2. Type, *S. Trailiæ*, *n. sp.* Distrib., Tropical S. America.

Spaniophlebia Trailiæ, *n. sp.*

Imago, ♂, in spirits, and dried; thorax atro-piceus; abdomen sub-piceous, with paler joinings; caudal setæ pitchy-black, with testaceous pilosity; forceps as in *Lachlania*. Neuration black; fore-wing with pabrachial nervure forked before the middle, and with cross-veinlets, as far as the præbrachial nervure only (another species has the furcation at the middle, and more numerous cross-veinlets extending as far as the anal nervure), viz.: about twenty-five in the marginal, two to five in the sub-marginal, one or two in the next area; the sub-costa towards the tip, and the neighbouring cross-veinlets, strongly bordered with dark fuliginous. Legs black with pale margins.

♀ unknown.

Long. corp. 9, al. 10, set. 8 mm.

Hab.: São Paulo, Rio Solimões, September and November (Mus. McLach.).

The other species (from Ecuador) has pubescent ♂ setæ about $2\frac{1}{2}$ times as long as the body.

HOMÆONEURIA, *n. g.*

Akin to *Lachlania*. Wing-membrane as in *Spaniophlebia*. Fore-wing with undivided longitudinal nervures, and no cross-veinlets; three sub-equal caudal setæ, in ♀ about one-fourth as long as the body and glabrous. Type, *H. Salvinia*, *n. sp.* Distrib., Central America.

H. Salvinia, *n. sp.*

Imago, ♀, dried. Head and thorax above smooth, black; wing-neuration fuscous; legs pale (discoloured); back of abdomen fuscous, with pale joinings, belly pale; setæ black. Long. corp., ♀, 11, al. 11—12, set. 3 mm.

Hab.: Guatemala.

ASTHENOPUS, Etn., = CAMPSURUS, Etn.

JOLIA, *n. g.*

Allied to *Polymitarcys*. Median caudal setæ abortive in both sexes. Neuration of the wings rather similar to that of *Polymitarcys*. Nymph agile, with seven pairs of abdominal trachæal branchiæ of uniform make, each consisting of an obovate membranous lamina, with a fascicle of filaments annexed to its hinder base (almost similar to the trachæal branchiæ of *Heptagenia*). Fore femur and tibia fringed within with dense stiff hair, as in *Oligoneuria* (tarsus slender). Mandibles not prolonged into a tusk; their lobes slender and acute. Caudal setæ natatorial, about seven-tenths as long as the body; the lateral setæ ciliated internally, and the median seta plumose for upwards of half their length, and then tail-pointed. Type, *J. Ræseli* (in *Palingenia*), Joly. Distrib., the Garonne, near Toulouse, in September. Drawings and specimens were most kindly transmitted to me by Dr. E. Joly; and I caught three nymphs last August at Toulouse.

RHOËNANTHUS, *n. g.*

Very like *Potamanthus* (restrict.), but with the median caudal seta abortive in both sexes; lateral setæ in ♂ upwards of twice as long as the body (in ♂ *Potamanthus* one and a-half times). Type, *Rh. speciosus*, *n. sp.* Distrib., Lahat.

Rhoënanthus speciosus, *n. sp.*

Subimago dried. Wings whitish, with most of the cross-veinlets well bordered with sanguineous, excepting those near the inner and terminal margins, where the wing-membrane is more or less tinted with ochraceous.

Imago dried. ♂, mesonotum lutescent or brownish-luteous. Fore-leg pale ochraceous, with the apex of the femur, the base and apex of the tibia, and the tarsal joinings tinged with purple or sanguineous; unguis dissimilar: posterior legs with the tarsal joints very narrowly tipped with sanguineous. Wings vitreous;

many of the cross-veinlets of the fore-wing conspicuously bordered with sanguineous, their borders more or less confluent, so as to form irregular blotches. Abdomen discoloured, varied with sanguineous above; belly ochraceous. Setæ pale ochraceous or whitish, with joinings more or less sanguineous or blackish-sanguineous, with which colour the forceps also are, in some measure, tinged.

The markings of the ♀ are less distinct than those of the ♂.

Long. al., ♂ 11—12, ♀ 16; corp., ♂ 13, ♀ 16; set. ♂ 25 and 1—26, and 1 mm.

Hab.: Lahat (Leyden Mus.).

The professedly temporary groups ranked provisionally with *Leptophlebia* in 1871, may be dealt with as follows:—

A.—Hind-wings somewhat arcuate in front (Trans. Ent. Soc. London, 1871, pl. iv, 20a and 26d). Basal joint of the ♂ forceps many times longer than the remainder taken together.

BLASTURUS, *n. g.*

Two long caudal setæ, the other abortive; lateral setæ in ♂ about three times, in ♀ about one and a half as long as the body; median seta about one-fifth as long as it. Fore tibia of ♂ scarcely longer than the femur, the tarsus about one and three-sevenths as long as the femur; unguis of posterior tarsi dissimilar. Type, *B. cupidus* (in *Ephemera*), Say. Syn., *Leptophlebia*, ser. 4, Etn., 1871. Distrib., Temperate N. America.

LEPTOPHLEBIA, Westw. (restrict.).

Three long, sub-equal caudal setæ; lateral setæ of ♂ about one and a half times as long; of ♀ nearly the same length as the body. Fore tibia of ♂ scarcely longer than the femur, but the tarsus nearly one and a half times as long as it; unguis of hinder tarsi dissimilar. Nymph with seven pairs of double tracheal branchiæ, each one bipartite with subulate divisions distantly beset with minute hairs. Type, *L. marginata*, Lin. Syn., *Leptophlebia*, ser. 3, Etn., 1871. Distrib., Northern Temperate Regions.

ATALOPHLEBIA, *n. g.*

Three long, sub-equal caudal setæ (or in individual specimens sometimes only two), in the ♂ usually twice as long as the body. Normal species: fore tibia of ♂ about one and a half times as long as the femur (in ♀ scarcely longer than it), and the tarsus about one and four-elevenths as long as the femur. Hind tarsus about half as long as the hind tibia; its unguis alike in shape, uncinat. Exceptional species: some Cingalese species have setæ three times as long as the body, the ♂ fore tarsus one and three-sevenths as long as

the femur, and the hind tarsus three-thirteenths as long as the hind tibia. Type, *A. australis* (in *Ephemera*), Walk. Syn., *Leptophlebia*, ser. 1, Etn., 1871 (exclusive of the last two reputed species). Distrib., S. Africa, Ceylon, Australasia, Japan, and S. America.

B.—Anterior margin of hind-wing suddenly refracted before the apex, somewhat as in fig. 24*b*, of Trans. Ent. Soc. Lond., 1871, pl. iv.

ADENOPHLEBIA, *n. g.*

Three long, sub-equal caudal setæ, in ♂ about twice as long as the body. Fore tibia of ♂ about one and one-sixth as long as the femur, the tarsus about one and one-fourth as long as the same; hind leg about one and a half as long as the intermediate leg; hind tarsus little over one-third as long as the hind tibia; unguis of the hinder tarsi alike in form, uncinat. Proximal joint of ♂ forceps' limb far longer than the rest put together. Type, *A. dislocans* (in *Ephemera*), Walker, the ♀ of *L. auriculata*, Etn., 1871. Syn., *Leptophlebia*, ser. 1 (part), and *idem*, ser. 2 (*L. colombiæ*, Walk.), Etn., 1871. Distrib., S. Africa; and apparently many Malay and Tropical American species belong here.

CHOROTERPES, *n. g.*

Three long, sub-equal caudal setæ; lateral setæ of ♂ about one and one-fifth as long as the body. Fore tibia of ♂ about one and eight-thirteenths as long as the femur, the tarsus about one and a half as long as the same; hind leg about one and five-thirteenths as long as the intermediate leg; hind tarsus nearly two-fifths as long as the hind tibia; hinder unguis dissimilar in form and size. Proximal joint of ♂ forceps' limb short, the next joint by far the longest (somewhat as in *Ephemerella*). Nymph latent, with seven pairs of foliaceous abdominal tracheal branchiæ, sparsely and very minutely hairy along their edges; 1st pair single, the blade entire, linear lanceolate, and acuminate; the remainder double, both divisions of each nearly alike, ovate, acute, proliferous or else deeply incised on both sides at the base of the produced points, and obliquely sub-cordate at the base. Type, *Ch. lusitanica*, *n. sp.* Distrib., Portugal; and, perhaps, *De Geer's Ephemera vespertina*, L. (though its gills are not proliferous nor auricled), indigenous to Scandinavia, may belong here.

The sub-imago rests with the outer caudal setæ divergent, the fore legs raised, so as to protect the tibia and tarsus, and held apart.

CHOROTERPES LUSITANICA, *n. sp.*

Sub-imago. Wings purplish-black throughout. Legs and setæ dark piceous; tibiæ and tarsi at first reddish-piceous.

Imago, v. v. s. Oculi strongly ascalaphoid, the upper part obscurely tinged with liver-colour; rest of head, and the thorax, black, polished. Legs blackish-piceous, the fore tarsi scarcely paler; but the hinder tibiæ and tarsi distinctly reddish-piceous, the latter being rather the darker. Wings vitreous, with a somewhat talcose gloss, the fore-wing tinged with blackish in the marginal and sub-marginal areas, the base of the costa somewhat testaceous, and the rest of the neuration piceous; cross-veinlets, in the coloured areas, numerous, viz.: in marginal area, six before, and about sixteen irregularly anastomosing beyond, the nodal point; in sub-marginal area, three before, and nine beyond, that point. Abdomen blackish-piceous, with pale rufescent joinings; beneath, the last segment but one is distinctly, and a few of the next preceding it are faintly, tinged with rufescent posteriorly. Forceps within and towards the tips rufescent. Penis and setæ blackish-piceous.

Long. corp., ♂, 10; al., ♂, 10; set., ♂ im., 12, sub-im., 9 and 12 mm.

Hab.: in the stream near Aldea de Neuves, Alemtejo, and near São Marcos da Serra.

C.—Anterior margin of the hind-wing deeply sinuated before the apex (compare Trans. Ent. Soc. London, 1871, pl. v, 2 b).

THRAULUS, *n. g.*

Three long, sub-equal caudal setæ (mutilated). Fore tibia of ♂ about one and ten-thirteenths as long as the femur, the tarsus about the same length as this last; hind leg about one and one-twelfth as long as the intermediate leg; hind tarsus almost half as long as the hind tibia; unguis of hinder tarsi dissimilar in form and size. Proximal joint of ♂ forceps' limb by far the longest. Nymph latent, with seven pairs of double tracheal branchiæ; the divisions of each of them alike in form, but those of the 1st pair filiform, simple, and minutely hairy, whilst the divisions of each of the others are foliaceous, oblong-ovate, fringed with long, simple, filiform processes. Type, *Thraulius bellus*, *n. sp.* Distrib., Portugal (and, perhaps, W. Indies).

Thraulius bellus, *n. sp.*

Sub-imago. Wings pale blackish.

Imago (living). ♂. Oculi fuliginose. Body blackish-piceous; the thorax deep black above, glossy, and with the sutures pale. Fore tarsi blackish, the hinder tibiæ and tarsi paler.

Long. corp., ♂, 8; ♀, 7 mm.

Hab.: in the stream below Cintra.

HABROPHLEBIA, *n. g.*

Three long, sub-equal caudal setæ, about thrice as long as the body in both sexes. Fore tibia of ♂ about one and one-third as long as the femur, the tarsus about one and a half as long as the same; hind leg scarcely longer than the intermediate leg; hind tarsus about one-fourth as long as the tibia; unguis of hinder tarsi alike in form,

uncinate. Proximal joint of ♂ forceps' limb sub-equal in length to the rest put together. Nymph latent, with seven pairs of abdominal tracheal branchiæ, all nearly alike in form; each one bifid into unequal segments, which are divided into slender filaments. Type, *H. fusca* (in *Ephemera*), Curt. Syn., *Leptophlebia*, ser. 5, with *L. Picteti*, Etn., 1871; also misprinted *Halecophlebia* (Etn., MS.), by Rostock, 1880. Distrib., Temperate and Southern Europe. [N.B.—The citation here given of *L. Picteti* is based upon recollection only.]

As I have suggested (in private correspondence) the possibility of Dr. Joly's *Cænis maxima* nymph being the young of a *Tricorythus*, I take the opportunity of stating that (judging from specimens in a better condition of preservation than those upon which I relied in the first instance), it is, after all, more likely to be a real *Cænis*. The examples previously examined by me, were all of them defective.

CALLIBÆTIS, *n. g.*

Allied to *Baëtis*. Two long caudal setæ, in ♂ two and a half times, in ♀ twice as long as the body. Fore-wing with several cross-veinlets in the marginal area before the nodus, in both sexes, and with single (if any) interneural veinlets at the terminal margin. Hind-wing tri-nervate, with several cross-veinlets, and with the costal shoulder very obtusely rounded off (compare Trans. Ent. Soc. London, 1871, pl. v, 27—29). Fore tibiæ in ♂ about one and one-sixth, in ♀ three-quarters, as long as the femur; the tarsus in ♂ about as long as, in ♀ about two-thirds as long as, the tibia, the 3rd joint in ♂ shorter than the 2nd joint. Type, *C. pictus* (in *Baëtis* formerly), Etn. Distrib., North and Central America and Australia.

BAËTIS, *Leach* (restricted).

Two long caudal setæ, in ♂ two to two and a half, in ♀ one and one-fourth to two and a half, times as long as the body. Fore-wing without cross-veinlets in the marginal area before the nodus (as a rule, almost without an exception) in both sexes, and with interneural veinlets in pairs at the terminal margin. Hind-wing bi-, or tri-nervate (the intermediate nervure in the latter case sometimes forked), and, generally speaking, destitute of cross-veinlets; usually oblong-ovate, with an acute costal projection, seldom (*B. atrebatinus*) without any costal shoulder at all (compare Trans. Ent. Soc. London, 1871, pl. v, 16 *a* to 26 *a*). Fore tibia in ♂ about one and one-third times as long, in ♀ the same length as the femur; fore tarsus in ♂ about one and a

half, in ♀ about three-fifths, as long as the femur, the 3rd joint in ♂ as long as the 2nd. Nymph agile, with seven pairs of single abdominal tracheal branchiæ, all nearly alike in form, viz.: obtusely ovate or obovate, and traversed lengthwise by a pinnately branched trachea, irregularly subdivided. The median seta is usually about three-eighths as long, the lateral setæ about three-fourths as long as the body; but sometimes (*e. g.*, in *B. amnicus*) the median seta is far more abbreviated. Type, *B. binoculatas*, L. Distrib., Europe and Egypt, Indo-Malay region, Australia; North, Central, and, perhaps, South America.

Some species of *Callibætis* and *Baëtis* have the front border of the anterior wings variegated in one or in both of the sexes.

(*To be continued.*)

DESCRIPTION OF ANOTHER NEW SPECIES OF *DAMASTER*.

BY GEORGE LEWIS.

I have now from the West Coast an insular species of *Damaster* which is very interesting to me, as the head and thorax show considerable divergence from the form usual in the genus. The insect comes from the island of Sado, where it appears to be rare, four specimens only being obtainable last month, and these came from the mountains eight miles from the coast. I characterize it as:

DAMASTER *CAPITO*, *sp. n.*

Nigro-violaceus, corpore vix lato, capite prothoraceque latioribus, validis, oculis subprominulis; elytris granulosis, haud mucronatis.

Hab. in ins. Sado.

Long. corp. 18—19 *lin.*

Head and thorax violet-black, elytra dull black; more robust in figure than *D. pandurus*, with shorter legs, more robust tarsi, head, mandibles and thorax much larger. The thickness of the head gives the region of the eyes a greater space, and renders them much less prominent, viewed from above they project but little beyond the outline of the head. The thorax is somewhat quadrate, widest in the middle, its greatest breadth equalling its greatest length, which is $2\frac{1}{2}$ lines, and the posterior angles are more acute than in any other described species. The thorax of *D. pandurus* measures, in an average specimen, $3\frac{1}{2}$ lines in width and 4 in length; what *D. capito* loses in length it gains in breadth. Elytra granulate, the striæ as usual scarcely visible.

In speaking of the dilated tarsi in the ♂ of the northern species, as compared to *D. blaptoides*, it must be observed that in *D. rugipennis*, *D. viridipennis*, and the present species, the tarsi are stouter in both sexes, but the difference in the ♂ and ♀ of any one is very little, not more than in the large southern species.

I have now explored North Japan as well as the time at my disposal permits, and I hope next year to give attention again to the south, beginning in Satsuma and then on to Biwa Lake. There seems to me to be good evidence that the large island of Nipon was formerly divided into two parts by the sea running through where the lake now is, and I believe the fauna of the whole of Japan can be apportioned into that of the north and that of the south; the line to be drawn from coast to coast across the Biwa Lake, rather than at any other place where the incursions of the sea at this time seem to indicate a more natural boundary. I have just received from Cape Sova (lat. $45^{\circ} 30'$, the extreme north of Yezo) a ♂ of *rugipennis*, measuring only 13 lines, with copper-coloured thorax instead of the ordinary green, so I am not hopeful of getting a second species in Yezo.

Yokohama : 8th November, 1880.

NOTES ON *CUCUJIDÆ* IN JAPAN, WITH DIAGNOSIS OF A NEW SPECIES.

BY GEORGE LEWIS.

Cucujus Mniszechi, Fairm., is not solely indigenous to Japan, for M. Ancey of Marseilles, has a specimen in his collection from Chefoo, in China. The species was first sent to Europe by two Japanese in a small collection forwarded for the Paris Exhibition of 1877, and the specimens are now in the French National collection and in Count Mniszech's. It is a beautiful blue species and the largest hitherto described, for I find that *C. imperialis* (Ent. Mo. Mag., vol. xv, p. 234) only equals small specimens of it. I took a fine series last June, and the first specimen measured one inch and one line, giving me a most uncomfortable nip with its powerful mandibles when I interfered with its liberty. It breeds in the large oaks which grow freely in the elevated forests of central Nipon,* the imago passing the winter under the bark. Two days since I found a lively pair.

There is a smaller species here, more common, living under bark of various deciduous trees, such as beech and elm, occurring in early summer and again in autumn, and ranging from Yokohama North to South Yezo. I briefly characterize it as:—

CUCUJUS COCCINATUS, *sp. n.*

Elongatus, depressus, niger. Statura omnino C. bicoloris, elytris coccineis, punctulatis, lateribus subcarinatis. L.c., 6—7 lines.

* Same latitude as Chefoo.

Both the Japanese species have the elytral carina less elevated than the Indian, and the punctures on the wing-cases are more distinct in the ♀ than in the ♂.

I have also found *Brontes planatus* here and in Yezo abundantly, both under bark of various kinds and in old houses at night, running on the rafters; and *Dendrophagus* occurs in mountains very sparingly under bark of pine and larch. I believe the latter species is not distinct from *D. crenatus*, which, with the *Brontes*, is in our British List.

Yokohama: October 31st, 1880.

DESCRIPTIONS OF FOUR NEW SPECIES OF *COSSONIDÆ* FROM
THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

ODEMAS.

O. OLINDÆ, *sp. nov.*

Ovale, sat elongatum, nitidissimum, nigro-æneum ad viridem accedens; rostro elongato, apice fortiter dilatato, confertim punctato; oculis sat magnis, convexis; antennis rostro capite prothoraceque vix brevioribus, funiculi articulis primo et secundo elongatis subæqualibus, clavâ fortiter elongatâ; prothorace antice angustato, fortius nec confertim punctato; elytris antice confuse punctatis, postice obscure carinatis, impunctatis, margine anteriori subelevato, humeris subprominulis; pedibus in primis robustis; subtus abdominis parte anteriori minus fortiter punctatâ. Long. $6\frac{1}{2}$ — $7\frac{1}{2}$ mm.

In dead branches of trees near "Olinda," the property of S. Alexander, Esq., on Haleakala, Maui; named in memory of my hospitable reception at that most agreeable sanatorium.

An extremely distinct species. The long rostrum and antennæ (of which latter the club measures more than half a millimètre), the prominent eyes, the defined front margin of elytra, and their subcarinate hinder portion, combine to produce a facies suggestive even of a distinct genus; but as each of these organs presents similar characters in a less degree in some one or other of the previously described species of *Oodemus* (even the elytral peculiarities being faintly represented in *nivicola*), I think it must take its place with them.

O. INFERNUM, *sp. nov.*

Ovatum, itidum, æneum ad viridem accedens, antennis rufo-testaceis,

pedibus piceis plus minusve rufescentibus, rostro lato, rugoso-punctato; antennis robustis, rostro capite prothoraceque conjunctis paulo brevioribus, funiculi articulo secundo primo paulo longiore; prothorace fortiter transverso, antice fortiter angustato, parce nec fortiter punctato; elytris haud striatis, seriatim fortiter nec crebre punctatis, interstitiis parce subtilius punctatis; subtus abdominis parte anteriori minus fortiter punctatâ. Long. $4\frac{3}{4}$ — $5\frac{3}{4}$ mm.

In bark; near the crater "Kilauea," on Mauna Loa, Hawaii.

The other described species whose elytra are not distinctly striated are either of elongate form, or having the elytra of the peculiar build which I have called "bisinuate;" *nivicola*, the striation of whose elytra is obscure in one sex, has totally different antennæ.

O. SUBSTRICTUM, *sp. nov.*

Ovatum, nitidum, nigro-aneum ad viridem accedens, antennis rufo-testaceis, pedibus piceis plus minusve rufescentibus; rostro fortiter punctato rugatoque; antennis rostro capite prothoraceque conjunctis paulo brevioribus, funiculi articulis primo et secundo elongatis, hoc illo paulo longiore; prothorace transverso antice angustato, parcius nec fortiter punctato; elytris a latere fortiter bisinuatis, confuse punctatis, aliquot punctis (quæ majora sunt cæteris) seriatim dispositis; subtus abdominis parte anteriori parce fortiter punctatâ.

Long. $4\frac{1}{4}$ — $5\frac{1}{2}$ mm.

Various localities on Haleakala, Maui, up to 4000 feet, but not taken commonly.

I have had specimens of this insect for some time past separated from the other species of the genus, and some doubtfully placed with *O. obscurus*. The addition and examination of fresh specimens this year have, however, led me to regard them all as appertaining to a single somewhat variable species, some examples of which are narrower and more elongate than others, while in some examples the punctuation (especially on the under-side) tends to become extremely confused, and even obscure. The distinctive features of the species appear to be, rather long, stoutish antennæ, with the basal two joints of the funiculus elongate, the 2nd markedly more so than the 1st, and elytra contracted about the middle, so that their outline is of two distinct curves. It is allied to *obscurum*, but differs by its average superior size, strongly sculptured rostrum, non-striate elytra, &c.

Of this, and the preceding species, I have examples in which the rows of punctures run into obscure striæ near the apex, according to a (probably sexual) peculiarity of the genus, previously referred to by me.

ANOTHEORUS.

A. IGNAVUS, *sp. nov.*

Æneo-piceus, antennis pedibusque plus minusve rufescentibus; rostro lato capite longiore, sparsim subtiliter punctato; antennarum funiculi articulo secundo primo vix longiore; prothorace antice fortiter postice plus paulo contracto, crebre fortiter punctato, lateribus rotundatis; elytris subparallelis, convexis, substriatis, striis crebre fortiter punctatis, interstitiis crebre punctatis.

Long. $5\frac{1}{2}$ —6 mm.

Haleakala, Maui; in the bark of the "Koa" tree, at an elevation of about 4000 feet.

Easily distinguished from its congener (*A. montanus*) by the strongly rounded outline of its thorax, which is much contracted behind, and the sub-parallel form of its elytra, on which the striæ are very faint, and the punctures in the striæ very fine, as compared with those of *montanus*.

Honolulu: November, 1880.

NOTES ON THE HAIRS OF HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

I published in the Transactions of the Entomological Society of London for 1878 the few observations I had then made on the hairs of our British *Aculeate Hymenoptera*. Since which time I have made a few further notes which I thought might be interesting to some of the readers of the Magazine.

I there observed that the *Melliferæ* or pollen-collecting bees differed from the other sections of the Order in having their hairs branched or plumose, at least on most parts of their body. Now, there are a few *Melliferæ* and Fossorials, &c., which have hairy eyes; and it occurred to me that it would be interesting to see if these very minute hairs which grow between the facets of the eye were also conformable to the rule observed above. I therefore compared the hairs from the eye of *Entomognathus brevis*, one of the fossorials, with those from the eye of a species of *Cælioxya*, one of the *Melliferæ*; the result being that the *Entomognathus* hairs appeared quite simple, whereas those of *Cælioxya* showed evident indications of branches, see

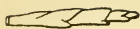


Fig. 1.

fig. 1. I think this experiment is interesting, as it seems to me that a character which is so well sustained, that it exists even in the minute hairs of the eyes, ought to be one of considerable importance.

In the same paper I also drew attention to certain hairs with dilated apices, and sharp apical edges, which occur on the inside of the posterior tibiæ of *Andrena*, and, as far as I have been able to make out, of all the *Melliferæ* (see fig. 2); since then I have discovered, on the inside of the front tibiæ

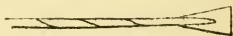


Fig. 2.

of *Bombus*, a series of hairs, which also have sharp edges, but in these the edge is lateral, and not apical (see fig. 3).

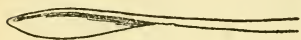


Fig. 3.

I think there can be little doubt that both these forms of hairs are useful for cleaning purposes, and that the directions of movement in the front tibiæ are such that they bring the lateral edges of the hairs into use, whereas those of the posterior tibiæ bring the apical edges. I have only as yet found these sharp-edged hairs on the *Melliferæ*, and, therefore, I think it probable that they are in some way specially adapted for the removal of the pollen-grains. A portion of the inner side of the front tibia of a *Bombus*, showing all the knife-like hairs in rows, is a most interesting object for the microscope.

Many Hymenopterists know well the scale-like hairs which clothe the abdominal bands of some of the European species of *Cælioxys*, and the thorax of *Andrena squamea*, &c.; these I have examined with a good deal of care, in order to see if I could find anything that could be called a true scale. Those which seem to approach most nearly to it are the scale-like hairs of *Cælioxys caudata*, but the scale-like appearance is only caused by the very close proximity of the branches, so that under a strong power the hair looks somewhat like a short fox's brush: in some the midrib is wide, and one can quite imagine that it might become so flattened and wide, as to bear all the branches on its dorsal surface, in which case we should get a hairy scale, but as yet I have found nothing of the sort, except in imagination. Unfortunately, I have very little time for microscopic study, as I am sure that attention to the subject of hairs generally, would repay any one who has the time and opportunity at his disposal.

Holmesdale, Upper Tooting :

4th December, 1880.

ON THE SPECIES OF THE GENUS *ORTHEZIA*.

BY J. W. DOUGLAS.

In my former article (p. 172, *ante*) two items were left in abeyance; on these I have now to offer some observations which, if not altogether conclusive yet, appear to be desirable to record: and I add a few remarks on other names or species in connection with the subject of this paper.

I have not succeeded in getting access to the "Goetheborgska Vetens. Handl.," 1778, which contains Modeer's monograph of *Coccidæ*, and can, therefore, only rely on Gmelin's synopsis of *C. uva*, Mod. (Syst. Nat., 2222, 42, 1788), which is as follows:

"*C. Testa rufa, fusca, sphærico gibbo, subflavescente. Habitat in Suecia sub lapidibus.*"

Now, as the only part of this that can possibly apply to an *Orthezia* is contained in the last two words, I think that Signoret did well to say, with respect to this species, "*Orthezia*?"

In the Mémoires de la Société Linnéenne de Paris, iii, 285—290 (1825), is an article entitled: "Description d'une nouvelle espèce de *Dorthesia* existante aux environs de Paris: par M. Arsenne Thiébaud de Berneaud, Secrétaire perpétuel."

After giving the account of *O. characias* already cited from the "Journal de Physique," the author, at p. 290, continues with respect to his new species *Dorthesia Delavauxii*:

"Il vit sur la face inférieure des feuilles de la germandrée sauvage (*Teucrium scorodonia*). Ses mœurs, ses habitudes et ses mœurs sont les mêmes que dans l'espèce dite *characias*. La tête, dans l'un et l'autre sexe, est visible, et armée d'un trompe d'un brun roussâtre, à la naissance de laquelle on aperçoit, à la loupe, des yeux bien distincts. Les antennes du mâle, plus longues que le corps, sont composées de neuf articles; celles de la femelle, qui sont très-courtes, n'en présentent que cinq. L'abdomen n'est point strié, mais découpé et comme frangé. Le mâle a en tout 7 millimètres (3 lignes) de long; ses ailes se relèvent à leur extrémité et dépassent d'un tiers la longueur du corps. La femelle est ovoïde et n'a que 5 millimètres (2 lignes); elle est aptère et ne prend point, comme la cochenille, la forme d'une galle après la ponte.

"Sur les feuilles de *Teucrium scorodonia*, j'ai vu en même temps la femelle du *Dorthesia Delavauxii*, les premières enveloppes de la larve et l'insecte nu qui est d'une couleur carmin. J'ai cru y voir aussi la dépouille de la larve d'une cochenille hexapode,* couverte d'une poussière blanchâtre, qui s'insinue dans le sac ovifère de la femelle, sans lui occasioner de mal, pour y dévorer sa progéniture. En deux on not be dit, la larve a terminé sa curée, elle sort du sac et va chercher ailleurs and so determine the

"Pour compléter l'histoire du *Dorthesia Delavauxii*, j'en donne ici la figure dessinée par notre habile confrère M. Theodore Descourtilz. Nous y sommes entrés dans les details que ne présentent nullement ni les deux figures qui accompagnent les articles consacrés au *Dorthesia characias* dans le journal du célèbre abbé Rozier, ni celle publiée par Degeer (Mém., vii, pl. 44, fig. 26),* et représentant le *Coccus farinosus*, espèce de *Dorthesia* que Modeer a recueillie sur les feuilles sèches du sapin, et qui, mieux observée, fera la troisième espèce du genre dont je viens de vous entretenir."

In the figures of the ♂ the antennæ and wings are not represented of the length described; the head has two projecting lamellæ, and the anterior part of the stout body only has, apparently, large tufts or lamellæ, the sides having four striæ, which may be intended to represent longitudinal lamellæ, for there appear to be posteriorly recurved, conjoined lamellations. The head is both described and figured as having a long rostrum. The ♀ is figured as an oval sac without any imbrication, dorsal or lateral, except anteriorly, and the antennæ are described as having but five joints.

Altogether this insect is an enigma, which Signoret has not attempted to solve, and although he places it as synonymous with *O. urticæ*, some only of the characters are problematically in accordance with this species, while the existence of a long rostrum in the ♂, which is both described and figured, goes to show that the insect is no *Orthezia*, nor any other of the *Coccina*.

Orthezia dispar, Kaltenbach, was never described, so far as I can ascertain; it is given thus by Kaltenbach in "Die Pflanzenfeinde," p. 486 (1874): "*Dorthesia dispar*? = *urticæ*, Brm." It is, therefore, merely a superfluous name.

In the "Natural History Transactions of Northumberland and Durham," iv, 370 (1872), the late Mr. T. J. Bold has the following note:—

"*Dorthesia characias*, Latr., West. Intro., vol. i, frontispiece, fig. 8, ♂; vol. ii, 445, fig. 118, 20, ♀ (*D. cataphracta*). The female of this curious creature was taken in Cold Martin Moss, Wooler, by Mr. Hardy. I once had a bunch of the culms of grass brought to me which had attached to them what might be the egg-bundles of this insect; they were silky-white, about the size and shape of a stout grain of rye, and full of pink-coloured eggs."

Now, it is erroneous to attribute *characias* to Latreille, and also to state that *cataphracta* is the female of that species; further, it is very doubtful if the "egg-bundles" were produced by a *Dorthesia* for it is not recorded by any observer that any egg-bag of th-

* This "fig. 26" (erroneously printed "fig. 6" at p. 174 ante) represents De Geer described and figured as a new species communicated to him is a widely different creature described and figured by De Geer (1776), and referred by Signoret *op. cit.*, p. 319, to *Gossyne*.

ever becomes detached. On the contrary, it has been noticed by more than one person (with respect to *O. urticæ*) that the young ones are hatched within the *marsupium*, which is in reality part of the body of the mother, and that they remain there for some time afterwards. Rather, these "egg-bundles" seem to resemble the "silky-white" ones which, on the same page, Mr. Bold ambiguously attributes to *Coccus vitis*, Linn., although they were found on a gooseberry bush in the open air, and only near a vinery.

In his report on the Insecta of the Arctic Expedition of the "Alert" and "Discovery," in the years 1875—76 (Linnean Society's Journal—Zoology, xiv, 118), Mr. McLachlan has this note: "From Disco Mr. Hart brought several examples of the ♀ of *Dorthesia chiton*, Zett., already recorded from Greenland." This refers to Zetterstedt's statement respecting his *D. chiton* (Ins. Lap., p. 314)—"Varietas antennis pedibusque fusco-testaceis, mihi e Groenlandia benevolentia D. Westermanni quoque communicata."

In the "Mittheilungen der schw. ent. Gesells.," vi, 6 (1880), Dr. G. Haller has an article entitled, "Ueber die Larve eines noch undeschriebenen Orthezia-ähnlichen Thieres." The author says that at Leissigen (Lake of Thun) in the moss on old fruit trees, he again and again has found *Orthezia* larvæ of two forms, one of which he identifies with *O. urticæ*, as described and figured by Signoret, the other similar but differing in several respects. The more essential points of divergence are:—the antennæ, which have apparently only four joints, yet the last and longest has indistinct indications of several flagellate articulations blended together (mehreren verschmolzenen Geisselgliedern):—the legs thickly set with many small tubercles (dicht von sehr zahlreichen Höckerchen besetzt):—and the character and form of the particles of the calcareous secretion on the body. The young larva-state only is noticed, but the author deems its specific characters so marked that, anticipating the discovery of the perfect form will confirm his opinion that it will prove to be a distinct species, he proposes it should bear the name of *Orthezia Signoreti*, being evidently unaware that Dr. F. Buchanan White had appropriated the name. It would be curious if, after all, the species in both cases proved to be the same; but with the particulars of the young larva-state only before us it is scarcely possible to say what the insect really is: yet it should not be difficult to obtain *in loco* some examples in the mature form, and so determine the matter.

DESCRIPTION OF A NEW SPECIES OF *DOLERUS* FROM SCOTLAND.

BY P. CAMERON.

DOLERUS SCOTICUS, *n. sp.*

Black; the four anterior knees and apex of tibiæ reddish, the red on the middle legs being more obscure than on the front pair. Head, thorax, and apex of abdomen covered with a long white pubescence. Head, pleuræ, and mesonotum distinctly punctured all over. Antennæ nearly as long as the abdomen, scarcely attenuated at the apex. Wings hyaline, costa and stigma black, the latter pale on the under-side. Tegulæ red. ♀.

Length, scarcely 4 lines.

Agrees with *D. puncticollis*, Thoms., in the punctured mesonotum, but the puncturation is much more distinct, the body is shorter, the antennæ longer, the abdomen more inflated, the marginal nervure is received further from the 2nd submarginal, the hind legs are entirely black, and the tegulæ red.

Taken at Braemar by Dr. Sharp in June.

Glasgow: 10th January, 1881.

Dimorphism of female Blepharoceridæ.—Since the publication of my article on this subject (p. 130 of this vol.), I received from Dr. F. Müller a very pleasant letter in reply. He says that there can be no doubt about the sex of those females, because they show distinct *receptacula seminis* and eggs; he adds that his paper, containing a detailed description of his observations, will be soon forthcoming. Dr. Müller's discovery thus involves three facts, new to the student of *Blepharoceridæ*: 1, that male and female do not always have the head and the front of the same structure; 2, that some species may have two forms of females; 3, that one of these forms has the organs of the mouth built upon a plan different from the type hitherto described as peculiar to the female. It remains now to be seen, whether some of the European species will not give occasion for similar observations? Dr. Müller adds to his letter a photographic copy of the beautifully-executed plate which will be added to his paper.—C. R. OSTEN-SACKEN, Heidelberg: January, 1881.

Habits of Bombylius (See *ante*, p. 161).—The December number of the "American Entomologist" gives further details about the preying of the larva of *Bombylius* on locust-eggs. The species of the fly was ascertained by breeding, nearly at the same time, by Mr. Lemmon in California, and by the able Editor of the Am. Ent., Mr. C. V. Riley. Two genera were obtained by Mr. Riley: *Systæchus*, a genus also represented in Europe, and occurring principally in dry plains; and *Triodites* (O. S., Western Dipt.), belonging to the group *Lomatina*. It must be borne in mind, however, that the larvæ of *Bombylius* (in the narrower sense) live in the cells of different bees (*Andrena*, *Colletes*, *Halictus*), as has been ascertained by the direct observations of MacLeay (Ann. N. H., 1838), Morelet (Bull. Soc. Ent. Fr., 1845, p. xxiv), Schmidt Goebel (Stett. Ent. Z., 1876, p. 392), and T. A. Chapman (Ent. Mo. Mag., vol. xiv, 1878, p. 196). What remains to be ascertained now, are the early stages of those larvæ, which, as Mr. Riley very acutely remarks (*l. c.*, p.

282), very probably are "much more active than in the later stages and of a somewhat different structure." This results from the fact that the fly performs the act of oviposition in the open air, that is, some distance from the underground-nest of the bee; this act was closely observed by Dr. Chapman; but we have also earlier observations, the earliest being that of Gilbert White (Nat. Hist. of Selborne): "The female (he says) seems to lay its eggs as it poises on its wings, by striking its tail on the ground and against the grass that stands in its way, in a quick manner, for several times together." A similar observation was made by Frauenfeld on the oviposition of *Lomatia* (Verh. Z.-B. Ges., 1864, p. 688). The statements of Zetterstedt (Ins. Lapp., p. 520) and Zeller (Isis, 1840, p. 25), on the oviposition of *Anthrax* differ in the fact that both observers saw the fly insert the end of the abdomen in the soil.—ID.

List of Muscidae Calyptera taken in a greenhouse.—During the month of August one of my greenhouses was entirely taken possession of by an immense swarm of wasps and flies, which devoured almost every grape in it. Perhaps a list of the flies may not be without interest. 1, *Sarcophaga carnaria*, common; 2, *Mesembrina meridiana*, abundant; 3, *Musca vomitoria*, abundant; 4, *M. erythrocephala*, common; 5, *M. Cæsar*, abundant; 6, *M. azurea*, rare; 7, *M. domestica*, abundant; 8, *Pollenia rudis*, abundant; 9, *P. nitens*, common; 10, *P. corvina*, common; 11, *P. sepulchralis*, common; 12, *Cyrtoneura stabulans*, common; 13, *Myospila mediatubunda*, very rare; 14, *Morellia hortorum*, rare; 15, *M. simplex*, common; 16, *M. curvipes*, very rare; 17, *Polietes lardaria*, abundant; 18, *P. albolineata*, abundant; 19, *Hyetodissa errans*, abundant; 20, *H. erratica*, common; 21, *H. lucorum*, abundant; 22, *H. signata*, rare; 23, *H. umbratica*, abundant; 24, *Hydrophoria anthomyia*, rare; 25, *Mydæa angelicæ*, common; 26, *Spilogaster quadrum*, rare; 27, *Hylemyia strigosa*, abundant; 28, *H. variata*, common; 29, *Homalomyia canicularis*, abundant; 30, *H. maniculata*, abundant; 31, *H. mutica*, common; 32, *Chortophila rotundicornis*, rare; 33, *C. angustifrons*, rare; 34, *Cænosia pacifica*, common; 35, *C. tigrina*, rare; 36, *Mycophaga fungorum*, rare.—C. W. DALE, Glanvilles Wootton: Dec. 2nd, 1880.

Recent captures of Coleoptera in the Forest of Dean.—*Cychrus rostratus* and *Scydmænus Sparshalli* in the refuse collected about stumps; *Calosoma inquisitor* and *Silpha 4-punctata*, ascending and descending trunks in early summer; on one occasion after a heavy shower the former insect was common under the oaks; *Dromius agilis*, two or three while hibernating; *Pterostichus oblongopunctatus* and *Choleva angustata*, under stones; *Acupalpus exiguus* (var. *luridus*), *Bradycellus harpalinus*, and *Lathrobium terminatum*, freely in a swampy piece of land; *Dinarda Mærkeli*, in nests of *Formica rufa*; *Eusphalerum primulæ*, in spring flowers; *Megacronus cingulatus*, under a log; *Prionus coriarius*, on stumps and paths; *Ptinus subpilosus*, on decaying oak; *Trypodendron domesticum*, very common on and in a sound beech stump, and also running on freshly felled timber; *Cassida equestris*, swarming on spear-mint in September; *Carabus arvensis*, *Elater pomorum*, and traces of *Strangalia 4-fasciata*, in rotten wood; *Ips 4-guttata*, in strong-smelling semifluid fungus attacking oak stumps; *Ips 4-punctata*, in profusion; *Quedius lateralis* and *Philonthus addendus* (?), in fresh stump-fungus, in numbers;

Quedius cruentus, *Leistotrophus murinus*, *Philonthus puella*, *Necrophorus mortuorum*, *Hister succicola* and *Omosita depressa*, in the same, when stale; *Priobium castaneum*, *Acalles ptinoides*, *A. turbatus*, *Cænopsis Waltoni*, *Rhinosimus ruficollis*, and *R. viridipennis*, on holly trunks; *Agathidium nigripenne*, *Ditoma crenata*, *Rhizophagus cribratus*, and *R. politus*, under bark; *Epuræa decem-guttata*, *Cryptarcha strigata*, and *C. imperialis*, at exuding sap; *Aphodius nitidulus*, *A. conspurcatus*, *A. oblitteratus*, *A. depressus* commonly, *A. sticticus* (1 example), and *Geotrupes mutator*, in horse and sheep droppings; *Corymbites pectinicornis*, *A. cupreus*, and the var. *ærginosus*, *C. metallicus*, *C. bipustulatus*, *Sericosomus bruneus*, and *Campylus linearis*, flying in the sunshine or at rest on *Pteris aquilina*; *Badister sodalis*, *Oxypoda soror*, *Megacronus analis*, *Lithocharis brunnea*, *Bythinus Curtisi*, *Cephenium thoracicum*, *Agathidium atrum*, *A. seminulum*, *Strophosomus retusus*, *Sitones cambricus*, *Barynotus mœrens*, and *Mniophila muscorum*, by shaking moss; *Elmis Volkmar*, *E. parallelipipedus*, *Telephorus alpinus*, *T. translucidus*, *Phytobius 4-tuberculatus*, *Orobis cyaneus*, *Orchestes ilicis*, *Rhynchites cupreus*, *R. pubescens*, *Liosomus ovatulus* (var. *collaris*), *Polydrusus micans*, *Clythra 4-punctata*, *Lamprosoma concolor*, *Cryptocephalus moræi*, *Chrysomela varians*, *C. didymata*, *Gonioctena pallida*, *Pachyta 8-maculata*, by sweeping.—A. E. HODGSON, Coleford, Gloucester: January, 1881.

Ocyusa picina in Warwickshire.—By stripping the folds of *Typha latifolia* growing in a boggy place not far from Birmingham, I recently captured several specimens of the rare *Ocyusa picina*, Aub. In its company were a few *O. maura*, great numbers of *Anchomenus puellus*, and three or four *Baris T-album*, as well as lots of commoner *Coleoptera*. The severe weather has put a stop to out-door entomologizing for a time, but, as soon as the frost ceases, I purpose searching for more *O. picina*, with the view of supplying any of my correspondents who may be in want of the species.—W. G. BLATCH, Green Lane, Smallheath, Birmingham: January 15th, 1881.

Plegaderus dissectus in Warwickshire.—On the 21st June last a single specimen of *Plegaderus dissectus* occurred to me whilst searching for *Diphyllus lunatus* amongst a fine crop of *Hypoxyton concentricum*, which had sprung out of the decaying trunk of a fallen ash tree in this neighbourhood. Under the bark of the same log I found *Ptinella angustula* and *Euplectus nigricans*, the latter being noteworthy, inasmuch, as until then I had never found *E. nigricans* except under oak bark.—ID.

Extraordinary vitality of Otiorhynchus ambiguus.—During a visit to the Isle of Wight in May last, I captured a number of specimens of *Otiorhynchus ambiguus*, which I placed in laurel until my return home. I carded the majority of them early in June; but finding fourteen specimens still alive, I put them in fresh laurel in a stoppered glass jar, where they remained until to-day. On taking them out to set them this evening, I was surprised to find that two individuals were still alive, after nearly eight months' close confinement in the poisonous laurel! The fact seems to me sufficiently extraordinary to deserve record.—ID.: January 18th, 1881.

Notes from Japan.—I have now returned overland to Yokohama from Awomori, 500 miles, having got a new *Chlanius* allied to *Noguchii*, a *Bembidium* near *articulatum*, and a single *Miscodera*, very nice, but not quite perfect. I have now done north Japan (getting 680 species new to me), and intend to travel south before January, and work north to the Biwa Lake as spring and summer advance. This year I started northward in the beginning of June, and the *Longicornia* came out in full burst to welcome me until I reached the most northern point, 650 miles from Yokohama, in mid August. I have got all my collection here safe and am packing it for England, for it is a veritable white elephant to me now. The bears troubled me much in the north, for they frightened the collectors, being very numerous this autumn, and came down to the houses for grapes, as food in the hills became scarce. I have only one ♂ of *Carabus Gehini*, the finest here, something between *Damaster* and *C. auratus*. *Euchirus* and *Dicranocephalus* do not turn up.—GEORGE LEWIS, Yokohama: November 3rd, 1880.

Observations on Vanessa in Japan.—In July and August, I observed in South Yezo specimens of *Pieris crataegi*, *Vanessa Antiopa*, *Io, cardui*, and *urticæ*; and it may interest English entomologists to hear of these insects in Japan. They are all hardy species, but if they flourish even intermittently between this and western Europe, they must at times be liable to many changes of climate and conditions of life, and the larvæ must, I think, feed on different species of allied plants. *V. Io* occurs in Japan as far south as Nambu, but both there and in Yezo there is a nettle which is very irritating to the hand when touched, and if this plant grew further south I should expect to find *Io* with it. But in looking at *Antiopa*, it may be said its food-plant is found down to the south of the Archipelago, yet it does not pass thither, so evidently the climate or some other cause checks it. I have seen *Antiopa* twice in England, the last time when a few years since (1872) so many captures were recorded in the Ent. Mo. Mag., and I think these periodical appearances merely exhibit the ordinary method in which many *Lepidoptera* distribute themselves when in superabundance in one locality; and, were there no special cause preventing it, *Antiopa* would establish itself permanently in England: each one of these flights is an effort to do so. Butterflies fly long distances, and merely crossing the channel from France or Germany is easily accomplished by any butterfly of *Vanessa*-power, and their flight is after all often mere resting on the wind. I have seen specimens of *Papilio* at sea, an hour before land was visible, in fine condition and so vigorous that when approached for capture they have fluttered away and gone off oceanwards, where of course they are finally lost. Now in Japan I have found species occupying a limited area, from there being other animals at hand ready to prey on them. An instance of this is noticeable here, for there is a total absence of the Magpie, which at Shanghai and other places in China is so abundant that any visitor of a few days must notice it, as it is there not in dozens but hundreds, forming quite a feature in the landscape. The cause of their absence here is, I think, the large crow (*Corvus japonicus*) which would destroy their eggs or devour their young, for the latter species plunders everywhere. A short time since a crow took a candle out of the lantern of my Jinrikisha, while I was eating my lunch within a yard of it, and a friend of mine in Osaka has had quail stolen from the frying pan by the same bird. Perhaps the cause of *Antiopa* not establishing

itself in England may be a parallel case to this, the house sparrow, or some other bird, may be fond of the conspicuous larvæ; for I do not think it is cut off by climatic causes from our island on account of having reached the limit of its distribution, and the food plant we know is there.

Of the winter of Hakodate I have made some notes elsewhere, and will merely remark that although it is much more severe than any weather ever felt in England, snow remains on the land three or four feet in thickness for two or three months, which protects both vegetation and animal life. Last spring near Fujiyama I took some snow off a mossy log, and putting my hand into the rotten wood felt it quite warm and drew out some half-dozen *Carabi* which had comfortably passed the winter there.—*Id.*: *October*, 1880.

Description of the larva of Euclidia glyphica.—On July 2nd, 1878, I received a good supply of eggs, together with the parent moth, of this species from Mr. Blackall, of Folkestone. The eggs were globular, and distinctly ribbed from the summit to the base: when first deposited they were bright pea-green, but soon changed to dull green, with, on the crown, a large brown blotch, and below this blotch a ring of the same colour. They began to hatch on the 10th of the same month, but the young larvæ were not all out before the 13th.

The newly-emerged caterpillar looks large for the size of the egg, being about three-sixteenths of an inch long, is very lively, and when walking arches its back like that of a Geometer. Colour a dingy semi-transparent pale green, barred with dark brown, or nearly black; head pale wainscot-brown and polished; and there are rather long hairs scattered over the body.

They fed up well and rapidly on both the white and red species of clover, and when from an inch to an inch and a quarter in length, I described them as follows:—

Long and slender for the size of the moth; body evenly rounded above, flattened below, tapering a little at the extremities; the head has the lobes rounded, and is a little wider than the second segment; skin smooth but not polished; segmental divisions well defined; the anal prolegs extended beyond the fold, and forming a distinct angle. By this time they have lost the true looper style of walking, but are still half-loopers, having no prolegs on segments 7, 8, 11 and 12. The ground colour varies from pale salmon to dull pink, some specimens having a strong yellowish tinge; a distinct double yellow line, enclosing another very fine still paler line, forms the dorsal stripe; the anterior point of the pale line on the crown of the head forms the apex of a triangular mark, the base of which is over the mandibles; the rest of the head is very dark brown; the sub-dorsal lines are dull bluish, bordered with smoke-colour, and enclose fine pale greyish lines; below the spiracular stripe is another irregular greyish line; and below this, but above the spiracles, is another line of pale bluish, edged with smoke-colour; the spiracular stripes are yellow, rust colour, or pink, in different specimens. The colours, indeed, vary considerably in different examples, in some the blue side-stripes being scarcely discernible; spiracles black, as are also the tubercular dots, which, though small, can be distinctly seen with a lens. Ventral surface dull dark smoky-purple, with two yellow central lines.

Most of the larvæ were full grown by August 7th. Length, an inch and three-quarters, and the salmon and pink colours of the younger specimens altogether lost.

The ground is now of various shades of ochreous-yellow, the darker specimens having a strong rust tinge along the sides; head of various shades of brown, in some being of a dark sienna colour; in all there is the pale yellow front triangular mark so noticeable in the earlier stage, and there is also another distinct streak of yellow on the side of each lobe; a brown stripe enclosing a very fine yellow line, and broadly edged outwardly with yellow, forms the dorsal stripe; a double smoke-coloured line composes the sub-dorsal stripe, and between it and the dorsal stripe are two other irregular yellow lines; above the spiracles is a yellow line edged on each side with smoke-colour, and between it and the sub-dorsal stripe another irregular yellow line; spiracles and tubercular dots black.

Ventral surface of various shades of dull ochreous, with two greyish central lines; a black mark on the 7th and 8th segments; and a smoke-coloured stripe below the spiracles.

Feeds during the night; in the day-time remains extended at full length, flat along the stalks of the food-plant.

The cocoon is composed of bits of the food-plant, firmly knitted together with very closely woven silk; in a state of nature, however, it would probably be on the ground. The pupa is about five-eighths of an inch long, and of the ordinary shape, though rather blunt and dumpy; colour deep purplish-brown, with the abdominal divisions and spiracles still darker; it is powdered over with a very pretty violet bloom, though more so on the head, thorax, and wing-cases, than elsewhere.

From these larvæ I reared a long and beautiful series of imagos the following June.—GEO. T. PORRITT, Highroyd House, Huddersfield: *January 8th, 1881.*

How to find the larva of Triphæna subsequa.—January and early February, if mild in the season, to sweep for the larvæ of *T. subsequa*. It feeds at night but is out on the blades and stens of grass in the afternoons, stretched at full length; it frequents dry sandy banks, especially where dense beds of *Dactylis glomerata* appear, I think it is entirely a grass feeder in its natural state, though it will eat other herbage in confinement, at least, I have never found it feeding on anything else but *D. glomerata* and *Triticum repens*.—H. WILLIAMS, Croxton Vicarage, Thetford: *December 28th, 1880.*

[These notes are additional to those published by Mr. Williams in this Magazine, vol. xiii, p. 210.—Eds.]

Remarks on monogamy, or the contrary, in Insects.—The remarks of Messrs. Douglas and Butler, *ante* pp. 114, 133, have brought to my mind two circumstances that may be of some little interest.

When at Norwich some years ago, I had the curiosity one day to examine the little bunches of dead hawthorn leaves, so common in closely clipped quickset hedges in the winter. To my surprise I found almost every bunch held together and fastened down to the twigs by a cocoon of the Vapourer (*O. antiqua*), and in nearly every case the cocoon was that of a female—evidenced by the batch of eggs spread regularly over it. It then occurred to me as a possible explanation, that the female larva must seek by preference a more sheltered or protected situation than that of the male. This may sometimes cause an apparent inequality in numbers between the sexes in the larva-state, certainly it would help to account for the difficulty of finding the female moth.

My other observation refers to the delicate subject of monogamy *v.* polygamy among insects. Mr. Butler's instance is hardly to the point, as his female proved *sterile*, and previous observations—as in the case of *Peridea trepida*, have shown that sterility may be the cause (or consequence) of repeated, and of course imperfect, union. But some years ago I had a lot of moths from silkworms (*Bombyx mori*) that the children had been rearing, and it occurred to me to subject them to a series of experiments. The result was that I found that each perfect male mated four, five, or even six times in the course of its short life, and the females each four or five times, and in all cases, even those of old males mated with recently emerged females, the eggs proved fertile. The rule appeared to be that union took place before the deposition of *each separate batch* of eggs.

I am fully prepared to admit that the habits of a moth reduced to so abnormal a state as to have lost the power of flight by domestication, cannot be held to be illustrative of those of species in a natural state, but I also think that such a creature possesses only an *exaggeration* of the habit and capabilities of the species when at large, and that there is little danger of female insects in a state of nature remaining sterile through the casual circumstance of a diminished proportion of males.—CHARLES G. BARRETT, Pembroke: *December 9th*, 1880.

Notes on Hymenoptera near Worcester in 1880—Notwithstanding that the spring came in early and fine, the solitary *Aculeata* were very few in both species and individuals, and continued so throughout the year. Even *Bombi* and *Apathi* were much scarcer than in 1879; but *Vespa vulgaris*, *V. germanica*, and *V. sylvestris* were about as common as usual.

The galls of some species of *Cynipides* were commoner than in any year since 1876; *e. g.*, *Dryophanta folii*, *D. divisa*, and *D. longiventris*: the last more numerous than I ever before witnessed. Galls of *Biorhiza renum*, which I vainly sought for since 1876, were again found.

The year seemed to be very favourable to some of the *Tenthredinidæ*. Among the species that turned up in the imago state in unusual numbers I may mention *Tenthredo mesomela*, *Tenthredopsis nassata*, and *Taxonus glabratus*. Among larvae, *Hemichroa alni* and *Cræsus septentrionalis* were strikingly plentiful on all their food-plants. *Nematus ribesii*, larva and imago, was most abundant. When walking among some market gardens at the end of July, I noticed hundreds of gooseberry bushes standing bare of leaves, and presenting a most desolate sight.—J. E. FLETCHER, Happy Land, Worcester: *November*, 1880.

Notes from Guatemala.—Since my last notes from San Gerónimo, I have twice visited the Polochic Valley, working down to the lake of Isabal; travelled over a great deal of the Alta, or northern part of Vera Paz, visiting Cahabón, Lanquin, Rio Chicoy, the Poban District, the Sinanjá Valley, Senahú, and nearly to the department of Peten. At the end of July I started for Los Altos and the Pacific slopes, travelling from San Gerónimo, by way of Rabinal, Cubulco, Joyabáj, and Quiché. I spent about a fortnight in the mountains of Sotonicaján, working up to nearly 11,000 ft.: then went to Quezaltenango, and from thence to the Pacific slopes of the volcano Zunil and Santa Maria, gradually working lower, till at last I arrived within

five leagues of the sea; being so near to the coast, I thought I would pay a hurried visit to Champerico, in spite of the terrific heat. I should like to send particulars of the fauna of the places visited, but have not sufficient spare time now.

I have met with varying success. In the pine forests of the very high elevations I found many genera, as at home:—*Epuræa*, *Temnochila*, *Astinomus*, *Hylastes*, *Hylurgus*, *Tomicus*, *Clerus*, *Rhizophagus*, *Phlæopora*, *Xantholinus*, *Helops*, *Bembidium*, *Amara*, *Hydnobius*? (a black species in moss, at 10,800 ft.), *Otiorynchus*, *Geotrupes*, *Aphodius*; small *Brachelytra* and many others, including some *Heteromera* allied to *Zopherus* and *Sepidium*; a small black and yellow day-flying Bombycid moth occurs in vast profusion at the highest places visited on the Cordillera. Here, on the coast, in two days' work, I have found, in addition to some interesting *Hymenoptera*, some few *Cicindelidæ*, small *Carabidæ*, *Heteromera*, &c.; the *Carabidæ* include such genera as *Harpalus*, *Amara*, *Metabletus*, *Blechnus*, *Lebia*, *Tachys*, *Bembidium* and the like; the *Heteromera*, divers *Anthicidæ* (*Anthicus* and *Mecynotarsus*), *Crypticus*, *Heliopathes*, *Phaleria* (two or three species, one nearly allied to, if not identical with, our own *cadaverina*), *Cistela*, &c. There are a few small *Brachelytra*, a small *Elater* (*Drasterius*), an *Ischnomera* (very similar to our own *melanura*, but smaller), a *Saprinus*, *Galeruca*, *Psammodytes*, and some few others—all very similar to the species of our own coasts, but averaging smaller in size. I look in vain for representatives of *Brosicus* or *Philonthus xantholoma*. In the *Hemiptera* I find a few small *Pentatomidæ*, a *Geocoris*, *Ophthalmicus*, a small *Capsus* or two, a *Coranus*, *Naucoris*, &c. In *Lepidoptera*, a very minute *Lycæna*, common amongst *Salicornia*?, a *Heliothis*, and a few others. In *Neuroptera*, only a few *Libellulidæ*, of species common in the interior.—GEO. C. CHAMPION, Puerto de Champerico, Guatemala: October 31st, 1880.

Obituary.

Jacob Boll was born at Würenlos in Switzerland, in 1828. After he had prosecuted his studies at Jena in Germany, he settled at Bremgarten in Switzerland as an apothecary. He was enthusiastically fond of natural science, especially Entomology and Botany, and devoted to these pursuits all his spare time.

He and Heinrich Frey first met in 1849 or 1850, at the house of Bremi-Wolff in Zürich, and they soon became firm friends. "Boll" says Frey, "was a born-collector, with a wonderful quick eye."

For many years Professor Frey met Boll repeatedly and they made excursions together. Boll's parents and an elder brother had emigrated to the United States and were settled in Texas, Jacob Boll had often talked of following them thither, and in 1869 he sold his business at Bremgarten and went to Texas.

After collecting there for 18 months, he was returning to Switzerland, when he met with Professor Agassiz at Cambridge, Massachusetts, who purchased from him his entire collection and promised to obtain for him employment at the Natural History Museum of Harvard College.

However, Boll returned first to Switzerland, and there family circumstances detained him for some time, Agassiz in the mean while still expected Boll's return to Cambridge, and the situation was kept open for him.

At last the cause of Boll's detention in Switzerland was at an end, and he was preparing to return to Agassiz, when a telegram announced the death of the latter, and that opening of a career for Boll was unfortunately closed.

Boll then returned to Texas and settled at Dallas, where for many years he collected insects most industriously, and, as we can speak from experience, he enriched the collections of Micro-Lepidopterists with long series of beautifully set bred specimens of North American Micros.

Latterly his attention had been more turned to geological and archæological researches, but we have lately heard that he had hoped to obtain the recognised position of State-Entomologist of Texas.

Early in September last, he started on an exploring expedition to the western part of Texas, there he was taken ill, and far from all medical assistance he died on the 29th September.

Achille Guenée—born at Chartres, January 1st, 1809, died at Châteaudun, December 30th, 1880—was, like his colleague Dr. Boisduval (who died precisely twelve months previously), one of the most distinguished Lepidopterists of France.

He received his education at the "collège" of Chartres, being one of the most promising pupils there. In early childhood he showed a taste for Entomology, and, when quite a boy, he knew no greater pleasure than the pursuit of the butterflies which frequented the neighbourhood of Chartres.

As years passed on, he soon applied himself more seriously to the study of his favourite Order of insects—the Lepidoptera, incited thereto by the good advice of his older friend, Mons. François de Villiers; in conjunction with whom, at a later date (1835), he brought out a thin quarto volume ("Tableaux synoptiques des Lépidoptères d'Europe").

At the close of his college career, he went to Paris to study law; the dry attractions of which had no effect in cooling his passion for Entomology, which derived fresh fuel from the sight of the collections at Paris, and the society of the numerous Entomologists who resided in the capital.

On his marriage in 1833, he quitted Paris and settled himself at Châteaudun, where he resided till 1846. He then returned to Paris to superintend the education of his son. It was at this period that, being in constant intercourse with Dr. Boisduval, he began to write the first volume of his *Noctuélites*, which was not published till 1852. It was during this interval that he received "un coup cent fois plus cruel" noticed in the preface to the *Noctuélites*, p. xxiii—the loss of his only son, who already gave great promise of future excellence.

This led to his quitting Paris abruptly—he returned to Chartres; there he could recall and apply his own words, addressed to the Société Entomologique de France, February 14th, 1849, when speaking of the benefits to be derived from Entomology—"Pensons," said he, "aux blessures de cœur qu'elle a guéries, aux illusions prêtes à s'envoler qu'elle a retenues, aux mécomptes dont elle a consolé, aux chagrins légitimes dont elle a adouci l'amertume, aux joies tranquilles dont elle sème la vie. Soyons fiers du bonheur qu'elle donne au pauvre comme au riche, à l'homme que le travail a fatigué, comme à celui que l'oisiveté tourmentait," &c.

Again, however, he was destined to experience the pleasures appertaining to a father; two daughters were successively born, and, accompanied by his wife and

daughters, he went to reside at Châteaudun, and at his country seat, "Les Chatelliers," in the neighbourhood. It was there, that in 1857, we had the pleasure of seeing him. It was but seldom that he quitted the country for Paris; but, by a strange coincidence, on the occasion of our very last visit to Paris, in March, 1872, we met Guenée there—we were never to meet again.

Guenée leaves a widow, two daughters (who are married), and three little grandsons. Let us hope that one of those grandsons may develop the tastes of his grandfather, and become a shining Entomological light in the next century.

The career of Guenée as an Entomological writer commenced in 1833, with a notice of the habits of the larva of *Nonagria paludicola* (var. *geminipuncta*) in the "Annales" of the French Entomological Society, vol. ii, pp. 447—453.

This was followed by several similar short notices, and, from 1837 to 1841, he wrote a series of papers on *Noctua*, including an Essay on the Classification of the *Noctua*; these appeared in the "Annales" of 1837, 1838, 1839, and 1841. These papers may be looked upon as the preparatory steps to his larger work on the *Noctua*, which appeared some years later. It was probably during this period that he furnished some of the descriptions of larvæ which appeared in Duponchel's "Iconographie des Chenilles."

In the French "Annales" for 1845, he published an Essay on the Classification of *Micro-Lepidoptera*, with a Catalogue of the European species. This paper (though without the interesting introductory chapter which occurs in the "Annales") was also published in a separate form under the title of "Europæorum Micro-Lepidopterorum Index Methodicus." This "Index" goes systematically through the *Tortricina* and *Crambina* (many new species being briefly described in Latin); but of the *Tineina* only the *Plutellidæ* and a portion of the *Hyponomeutidæ* were given.

No doubt the author had intended (as he calls this "*Pars Prima*, sistens *Tortrices*, *Phycidas*, *Crambidas*, *Tinearumque initium*") to have brought out subsequently a "*Pars Secunda*," with the remainder of the *Tineina*; but his subsequent Herculean labours amongst the *Macro-Lepidoptera* prevented the completion of this "Catalogue of *Micro-Lepidoptera*."

Guenée's greatest work appeared in 1852—3 volumes 8vo, extending to more than 1300 closely printed pages, treating of the *Noctua* of the whole world. At the time this appeared the mass of interesting matter relating to the habits of species, as observed by the author himself, formed a vast addition to our previous knowledge of the subject.

These volumes formed part of the Series of the Suites à Buffon "*Spécies Général des Lépidoptères*," of which the first volume, treating of a portion of the *Rhopalocera* from the pen of Dr. Boisduval, had appeared as far back as 1836 (see Ent. Mo. Mag., xvi, p. 235). In 1854 Guenée brought out another volume of the Series containing the "*Deltoides et Pyralites*." Three years later there appeared two more volumes containing the *Geometrina* ("*Phalénites*").

There are thus six volumes of the Suites à Buffon from Guenée's pen, and no Entomological Library is complete without them.

In 1868 there appeared, in the 5th volume of this Magazine, a series of descriptions by Guenée of Heterocerous Lepidoptera collected^{alto} by Mr. Fereday in New Zealand.
d, hav

In the French "Annales" for 1870, p. 5, Guenée described the singular gall-making Lepidopterous insect, *Ecoecis Guyonella*. This is immediately followed (p. 17) by a very interesting account of an Entomological excursion to Celles-les-Bains, in Ardèche; a locality to which attention had already been drawn by the visits thither of M. Milliére and of Dr. Staudinger.

In 1875 there appeared a Catalogue Raisonné of the *Lepidoptera* of Eure-et-Loir, the Department in which Châteaudun is situated. This was a publication of the Société Archéologique d'Eure-et-Loir, and was probably printed at intervals—the title page bears date 1867; the introduction is dated "Mars, 1866," and the concluding paragraph bears date "1er Mai, 1874." This is, we believe, the last work which emanated from Guenée's pen. It possesses for us a more than common interest, for in it we find that two previous notions, which had to us appeared strangely unscientific, are quietly ignored.

In the first volume of the Noctuérites of the Suites à Buffon, p. 320, we read, *Triphæna pronuba*, Albin; in the Lépidoptères d'Eure-et-Loir, p. 192, we find the more generally used expression, *Triphæna pronuba*, Lin. Further on, in the same volume, we find the uniform *-ella* termination for *Crambina*, &c., gently dropped. Thus we find, p. 273, *Scirpophaga alba*, p. 275, *Galleria cereana* and *Melliphora alvearia*; thirty years previously, in the Index Micro-Lepidopterorum, these three species had all been forced to bear the termination *-ella*.

In the very last paper published by Achille Guenée, "Etude sur les Yponomeutides," in the "Annales" of the French Entomological Society, 1879, p. 281, we have an instance of the mellowness of feeling produced by advancing years in the very benign mention of the Museum Catalogue of Francis Walker; he only remarks that "cet ouvrage n'a pas assez de précision," to allow of the species described being quoted without a personal* investigation.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 1st, 1880. Sir J. LUBBOCK, Bart., M.P., &c., President, in the Chair.

Mr. Pascoe exhibited a series of *Arescus histrio*, collected in Ecuador by Mr. Buckley, illustrating the extreme and asymmetrical varietal conditions; the Rev. H. S. Gorham and Mr. C. O. Waterhouse also alluded to the same subject.

Mr. Billups exhibited four species of *Pezomachus* (noticed as *Mülleri*, *juvenilis*, *intermedius*, and *incestus*) new to Britain; also 20 species of *Coleoptera* from corn-refuse from Mr. Fitch's granaries at Maldon.

Sir J. Lubbock exhibited specimens of one of the *Phasmidæ* sent to him from St. Vincent.

Mr. Cansdale exhibited examples of *Tischeria gaunacella*, bred by him from *Prunus spinosa*.

Mr. Scott communicated a paper on *Hemiptera* from Japan.

Mr. C. O. Waterhouse read a paper on a new species of *Polycenes*, in which he retracted his former opinion as to the affinities of the genus, and acknowledged its connection with the *Hemiptera*.

* We are by no means certain that this necessity of personally examining "Walkerian" types has not been a great service to our favourite science. Learned students of various groups of insects come from the very ends of the earth to consult the collection of the British Museum, and but for this imperative necessity of their so doing, who knows whether some would ever have visited Europe at all? Thus, indirectly, Francis Walker may have conferred a great boon on our science.

TRICHOPTERA AND NEUROPTERA OF THE UPPER ENGADINE IN AUGUST.

BY R. McLACHLAN, F.R.S., &c.

In the "Entomologist's Annual" for 1871, pp. 15—17, I published a few notes on Swiss *Trichoptera*, some of which related to materials collected by Mr. Stainton in the Engadine in 1870. At that time the hope that I might some day go over the same ground scarcely existed with me. However, on August 6th, 1880, I left home at 8 a.m. for the Engadine, and travelling direct *viâ* Boulogne, Paris, Belfort, and Basle, arrived at Zürich at 12.30 p.m. on the 7th. Leaving Zürich on the morning of the 9th, I was at Chur in the afternoon of the same day. Having *posted* my portmanteau for Pontresina, I walked on to Churwalden in the evening, and slept there, joining the diligence party at 8.30 next morning,* for the Engadine *viâ* the Albula Pass. The burning of the old bridge over the Rhine at Reichenau, which occurred a day or two previously, probably diverted, for the moment, some of the traffic over the Julier Pass *viâ* Thusis, so that from Churwalden to Samaden (within three miles of Pontresina) the travellers formed quite a large party, accommodated in two large diligences and three "supplémentaires." The weather was tolerably fine, but cold: snow had fallen the previous night on the Albula Pass, and the mountains had a thin covering of fresh snow; large patches of unmelted old snow also lay here and there in hollows far below the road, for the summer had not been a warm one in Switzerland. At the Albula Hospice (7582 feet) the rush of shivering travellers in quest of hot coffee was almost ludicrous. Delay was occasioned in waiting for lateral posts, &c., and it was past 9 p.m. before we reached Pontresina, where the portmanteau had previously arrived by a night post. To my dismay all the hotels were crammed, and any chance of obtaining a bed in one of them was hopeless; not a pleasant prospect at that time of night, and especially as I had planned a stay of ten days. However, a room in a small house, difficult of access, and still more difficult to descend from in the morning, was procured, and here I stayed until the 20th, taking meals only in one of the hotels.†

* By this means the inconvenience of having to leave Chur at 5.30 a.m. was avoided.

† The simplicity of the Engadine is a thing of the past. "Society" has taken possession of the district, at any rate in August, and I more than once heard Pontresina, St. Moritz, and St. Moritz Bad likened to Brighton carried into the Alps. At Pontresina 800 beds are now not sufficient to accommodate the visitors in August. As a hint to future travellers who (like myself on this occasion) may be alone, it is well to say that fair sleeping accommodation may sometimes be obtained in houses belonging to a resident who lets out the rooms, and, if it be preferred, meals can be obtained in a German restaurant, thus avoiding the hotels altogether. In July the place is not so full. The Americans, so ubiquitous in the Bernese Oberland, have not yet appeared in the Engadine in force.

Pontresina itself lies at an elevation of 5915 feet, and the district explored by me occupies about ten miles in various directions therefrom, and at from 5600 ft. to 6800 ft. in elevation. The return journey was *viâ* the Julier and Schyn Passes (arrangements having been made, in the meantime, for the conveyance of passengers and their belongings on an improvised raft across the river at Reichenau), and the highest point at which any Trichopterous captures were made was at the little inn on the summit of the Julier Pass (7503 feet) during the short time the diligence stopped.

The principal hunting-grounds were the Val Roseg as far as the glacier; the Lake St. Moritz, and the Statzer-See (in the wood) which discharges into it; the Val da Fain (no doubt a paradise for a Lepidopterist, but practically useless for my purposes, owing to the utter absence of trees and the snow-fed stream); the wild rocky ground in a forest of larch and arolla (*Pinus cembra*) through which the torrent from the Piz Languard finds its way; a nearly similar locality on the right of the road to Samaden; the Val Celerina (in which are magnificent old larches); and the Val Bevers.

In my "Revision and Synopsis of the *Trichoptera* of the European Fauna," Appendix, p. xciv, I pointed out the deterrent effects of the vicinity of glaciers on aquatic insect-life. Those remarks came before me very vividly on this excursion. The stream at Pontresina, termed the Flatzbach, is utterly devoid of Trichopterous life, being poisoned by the Roseg and Morteratsch glaciers, but above the latter it is productive. A glacier-fed stream is turbid and milky; a snow-fed stream is usually clear and blue after the spring and early summer meltings are over, but even such a stream as this is seldom very productive, unless it is also largely fed by lateral rivulets from land springs, and these latter are the best of all. Naturally, in such a district these are not abundant, and long distances must be travelled over for their discovery *

The results of my excursion were about 450 specimens, represented by the species enumerated below. Rather to my disappointment, no species that can absolutely be identified as new was discovered; but some purely alpine forms were abundant; still, however, not so great a number of species were taken as I had anticipated finding. There was a marked absence of those small forms usually so abundant in lower districts where the water is warmer. The

* Geological conditions also influence aquatic insect-life. Limestone districts are probably the best. Schist is fatal: perhaps the most remarkable instance of this is to be seen at Thusis, where, in consequence of schist, the Nolla, at its junction with the Rhine, is of inky blackness, and useless for entomological purposes.

Trichoptera are chiefly represented by alpine *Limnophilidæ* and *Rhyacophilæ*. Perhaps the most remarkable of all is *Limnophilus subjectus*, about the last species I expected to find: originally recorded from Arctic America (and extending to Maine in the United States), it has lately been found commonly in Finland and Scandinavia, but its most southerly known distribution in Europe was the south shore of the Baltic; essentially a boreal species and an inhabitant of districts of little elevation in the north, we find it again in the high Alps at about 6000 feet, a striking instance of the affinity that exists between the insects of the north and those of the high Alps very much further south, and under differing physical conditions, excepting the one point of probably equal mean temperature.

For greater abundance, both in forms and individuals, a lower elevation, warmer water, and richer shelter, are necessary. Very few of the species found by Professor Zeller at Bergün (about 4550 ft., on the other side of the Albula Pass) were seen, and many of my captures were not represented amongst his. Difference of season may partially account for this, but the main reason is difference of altitude. On my journey from Churwalden I took mental notes on the probable capability of the localities, and the most likely of these appeared to be between the village of Filisur and Bergün, a mile or two from the former.

The Upper Engadine captures were as follows:—

TRICHOPTERA.*

PHRYGANEIDÆ.

Phryganea obsoleta (Hag.), McLach.—Not uncommon at the Statzer-See; it had been only recorded as Swiss from a specimen caught by Mr. Stainton at Maria in 1870, but at Zürich I found that it occurs near that city, and probably in other localities, the Swiss Entomologists having confounded it with *Ph. varia*.

LIMNOPHILIDÆ.

Limnophilus rhombicus, L.—One ♀ at the streamlet between the Statzer-See and Lake St. Moritz. Certainly an unusual altitude for this insect: the example is very typical in size and colours, but the appendages (known to vary) are much more linear (less dilated at the base) than is usual.—*L. despectus*, Walk.—Two ♀; Statzer-See and Val Bevers, beaten from *Pinus cembra* (*vide supra*).

Acrophylax zerberus, Brauer.—One ♀ at a torrent between Pontresina and Samaden; as yet this is a scarce insect.

Asynarchus cœnosus, Curt.—The large alpine form was generally distributed and common; especially so between Pontresina and Samaden, where it was sitting on the "stone posts" mentioned in my notes in Ent. Ann., 1871, p. 15. I suspect the larvæ do not affect torrents, but live in shallow, almost standing water, such as is often found by the roadsides.

* The nomenclature used here is the same as in the Systematic Catalogue in my "Revision and Synopsis."

Stenophylax picicornis, Pict.—The ♂ common at a lateral streamlet in the Val Roseg, but only one ♀; one ♀ near the Statzer-See.—*S. latipennis*, Curt.—Val Celerina, two very dark ♀.

Halesus digitatus, Schrk.—One ♂ between Pontresina and Samaden (probably early), darker than examples from flat districts.—*H. ruficollis*, Pict.—More than twenty examples; especially frequent at a torrent between Pontresina and Samaden (I now suspect that *H. mæstus*, McLach., is not distinct).—*H. hilaris*, McLach.—One ♀ at the torrent above-mentioned (probably early).—*H. auricollis*, Pict.—Scarce (probably early). Two ♂ between Pontresina and Samaden, one ♀ on the summit of the Julier Pass.

Metanæa flavipennis, Pict.—Generally distributed; very common in the Val Celerina; varying greatly in size.

Drusus discolor, Rbr.—Generally distributed and common; about fifty examples, varying much in size and in the comparative duskiness or brightness of the wings.—*D. chrysotus*, Rbr.—Rare. One ♂ and one ♀ in the Val Roseg near the glacier, one ♀ in the Val da Fain.—*D. trifidus*, McLach.—Streamlets supplying the Statzer-See; more common at small streamlets between Pontresina and Samaden. The examples are remarkably small.

Cryptothrix nebulicola (Hag.), McLach.—Abundant at the torrent in the Val Languard, and also at another between Pontresina and Samaden; those from the latter locality are very large.

Potamorites biguttatus, Pict.—Three very dark ♂ at a streamlet in the wood opposite Pontresina, but no ♀: thirteen ♀ along the stream in Val Bevers, but no ♂ (almost the only species found along this snow-fed stream). I am at a loss for a reason to account for this unequal distribution of the sexes. The ♀ shows great variability in the length of the discoidal cell, as already remarked.

LEPTOCERIDÆ.

Beræa pullata, Curt.—Two ♂ at boggy ground in Val Bevers.

Odontocerum albicorne, Scop.—Very common at the Lake St. Moritz; also along the Inn between Celerina and Samaden.

Mystacides nigra, L.—Lake St. Moritz.

HYDROPSYCHIDÆ.

Dolophilus copiosus, McLach.—One ♂ in the Val Celerina.

Wormaldia occipitalis, Pict.—One ♂ between Pontresina and St. Moritz.

Plectrocnemia conspersa, Curt.—One ♂ at the stream between the Statzer-See and Lake St. Moritz.

Holocentropus dubius, Rbr.—One ♂ at the Statzer-See.

RHYACOPHILIDÆ.

Rhyacophila persimilis, McLach.—A few examples at the falls of the Inn at St. Moritz. A few others from the stream between the Statzer-See and Lake St. Moritz show a distinct difference, although the localities are so near each other. They have the dorsal process shorter and broader, and the dilatations of the penis more acute, thus showing a tendency towards *Rh. acutidens*, McLach., without, however, being sufficiently pronounced to be identified therewith.—*Rh. vulgaris*, Pict.—Decidedly scarce; taken singly above the Morteratsch glacier, and between

Pontresina and Samaden.—*Rh. proxima*, McLach.—Nearly fifty examples of what I am bound to consider *proxima* were taken at various torrents in the district (also one ♀ on the summit of the Julier Pass). In examining this long series, a good deal of variation is evident (independent of locality) in the form of the dorsal lobe and in that of the penis, which latter not infrequently has the angles distinctly (though but slightly) produced, and in this case difficult to separate from *intermedia* (*contracta* and *fraudulenta* I take to be sufficiently marked, according to present evidence). The examples are mostly very large (one ♀ expanding to 37 mm.). The variation in the horny anal parts is of somewhat serious interest; in one ♂ the dorsal lobe forms an elongate triangle, and had it not occurred with more ordinary conditions, this example must have been considered specifically distinct.—*Rh. glareosa*, McLach.—At the torrent in the Val Languard, and at another between Pontresina and Samaden, also at a waterfall in the Val Bevers; tolerably common.—*Rh. stigmatica*, Kol.—In company with the last at the torrents mentioned, and more common than it.

PLANIPENNIA.

SIALIDÆ.

Sialis lutaria, L.—Lake St. Moritz; of ordinary size and colour; very late for this species.

CHRYSOPIDÆ.

Chrysopa vulgaris, Schn. —One example between Pontresina and St. Moritz; the only species seen.

HEMEROBIIDÆ.

Hemerobius nervosus, F. ?—A few ♀ from Val Roseg, Val Bevers, and between Pontresina and Samaden; beaten from larches (I am by no means certain that these are true *nervosus*, the ♀ having a short upturned ovipositor).—*H. fasciatus*, Göszy.—A few examples with the last.

CONIOPTERYGIDÆ.

Coniopteryx psociformis, Curt.—One example near the Morteratsch Glacier.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Elipsocus unipunctatus, Müll.—One example in the Val Roseg.

PERLIDÆ.*

Dictyopteryx alpina, Pict.—On the Flatzbach and between Pontresina and Samaden; taken singly. This is one of the few insects that can exist in glacier-fed streams. Along the Flatzbach the nymph-skins were numerous, sticking on stones, &c. In the Val Roseg I found three ♀ (under stones) of what must be a micropterous form, in which the wings are not longer than the abdomen when in a fresh state; they agree with the long-winged form in all other respects. It is probable that this form was considered by Pictet as the ♂ (cf. "Perlides," p. 162, pl. viii, fig. 7); the examples before me appears to be certainly ♀. In a series of nearly 20 examples of *D. alpina* I find only two or three that seem to be ♂, and in those the wings are not abbreviated.

* The nomenclature in Lists of *Perlidae* must be considered as approximate only; there are few Families of insects that so greatly need thorough revision, and in which the difficulties are so many.

Chloroperla rivulorum, Pict.—Generally distributed along the torrents. All the specimens collected appear to pertain to this species.

Isopteryx torrentium, Pict.—Generally, but sparsely, distributed. The examples appear to belong here rather than to *tripunctata*, Scop. (*flava*, Pict.).

Leuctra cylindrica, Pict.—Here and there; a few examples. (It is scarcely probable that this is the *cylindrica* of De Geer).—*L. nigra*, Pict.—One example from near the Statzer-See should probably be referred here.

Teniopteryx prateata, Burm.?—Val Roseg.—In the same locality was found another species of the genus, which I cannot identify.

Nemoura inconspicua, Pict.—Val Roseg.

EPHEMERIDÆ.

The few materials for this Family are in Mr. Eaton's hands, and have not yet been fully determined. A large *Heptagenia* allied to *longicauda*, Steph., was very common at the Lake St. Moritz; another species of the same genus, allied to *semicolorata*, Curt., occurred sparingly in other localities. A *Baëtis* was found at the Statzer-See.

ODONATA.

Sympetrum striolatum, Chp., and *S. scoticum*, Donovan.—Statzer-See.—*S. meridionale*, Selys.—Sparingly, usually along the road-sides far from water; infested with the red *Acari* to the attacks of which this species seems so particularly liable.

Cordulia metallica, V. d. L., *C. alpestris*, Selys, and *C. arctica*, Zett.—Statzer-See (*vide ante*, p. 141).

Æschna juncea, L., and *Æ. borealis*, Zett.—Statzer-See (*vide ante* p. 141).

Three or four other species of *Odonata* were seen at the Statzer-See, but could not be caught on account of the boggy nature of the ground; amongst them was one of the *Agrionidæ* (probably *Enallagma cyathigerum*, Chp.).

Lewisham, London: December, 1880.

NOTES ON EXOTIC RHYNCHOTA.

BY W. L. DISTANT.

HETEROPTERA.

Fam. *REDUVIIDÆ*.

APIOMERUS OBERTHURI, n. sp.

Black; apical half of membrane creamy-white, under-side of body dull luteous, disc of abdomen pitchy, coxæ, trochanters, and femora sanguineous, eyes luteous.

Length, 20 mm.

Hab.: Teffé (Ega), Amazons (*de Mathan*). Coll.: Oberthür.

Allied to *A. apicalis*, Burm.; but differs in the colour of the legs and the narrower pronotum, with the central longitudinal incision to posterior lobe narrower, but more sharply defined.

HOMOPTERA.

Fam. MEMBRACIDÆ.

TRIQUETRA INTERMEDIA, n. sp.?

Triquetra inermis, Fairm., var.?

Closely allied to *T. inermis*, but differs by the anterior dorsal ridge of the pronotum being produced into a distinct, compressed, erect, and somewhat anteriorly-directed spine-like process. Length, 14 mm.

Hab.: Bogota (*Dr. Thème*). Coll.: Oberthür and Distant.

This form is intermediate between *T. inermis*, Fairm., and *T. nigro-carinata*, Fairm., and only differs by the following characters:—from the first, in which the dorsal spine is absent or obtusely indicated; and, from the second, in which the same spine is much more produced.

As in *T. inermis*, many specimens exhibit a strong tendency to develop prominently this pronotal spine, I should incline to the opinion that *T. intermedia* is only an intermediate form between the two other described species (?), and that the three are only phases of one protean type. However, I have been reluctantly obliged to give the specimens described a specific name to prevent my treating *T. inermis* and *T. nigro-carinata* as synonymic, more especially as Stål has described another species, *T. recurva*, in which this spine is even more produced, but of which that author remarks: "*T. inermis* et *T. nigro-carinata* valde affinis, cornu dorsali ejusque forma divergens;" and also, "In exemplo feminino, specifice haud diverso, cornu lateralia thoracis valde antrorsum et sursum vergunt." This last observation may be probably explained by the law frequently enunciated and lately again exemplified in butterflies by Mr. Wood-Mason (J. A. S. B., vol. xlix, p. 418), that secondary sexual characters acquired by the male have been partially transmitted to some females, but not to others. As *T. inermis*, *T. intermedia*, *T. nigro-carinata*, and *T. recurva*, have all been received from Colombia, and as they are also distinct from other species of the genus in the common character, "Carina dorsali thoracis nigra," and their specific differentiation depends on the amount of development of the anterior portion of the pronotal dorsal ridge, the probability of them all being but different forms of one protean species is much increased, and we may possibly only require larger series of specimens to find all the intermediate links. The words of Mr. Darwin may be here well applied: "A part developed in any species in an extraordinary degree or manner in comparison with the same part in allied species, tends to be highly variable."

Selston Villas, Derwent Grove, East Dulwich :
January, 1881.

AN ADDITIONAL SPECIES OF BRITISH HOMOPTERA.

BY JAMES EDWARDS.

Several examples of both sexes of the insect described below were sent to me for examination some time since by Mr. Douglas, with an expression of his opinion that it would prove to be the *Anomia sulphurella*, Zett., of Lethierry's catalogue. Having mounted the ♂ genitalia, and found that it differed in that respect from the species to which it is apparently most nearly allied, viz., *rosæ* and *Douglasi*, I sent a pair to Mr. Lethierry, who returned them as the *sulphurella*, Zett., of his catalogue. According to Sahlberg, however, *sulphurella*, Zett., = *Thamnotettix virescens*, Fall., and, therefore, another name becomes necessary for our insect, and the one I have applied seems expedient. The structure of the central genital process (genital style) in the ♂ will, I think, sufficiently demonstrate the distinctness of the insect before us. In the case of single examples of the ♀ some care is requisite, in order to separate this species from *rosæ*, ♀; the latter is, however, somewhat smaller, and the crown is longer and narrower, with the outline of the posterior margin in a continuous curve, without any trace of an angle.

TYPHLOCYBA LETHIERRYI.

Anomia sulphurella, Lethierry, Cat. Hem. Nord., edition ii, p. 75.



Crown: posterior margin (including the eyes) forming a distinct but obtuse angle, anterior margin gently convex in the ♂, more produced, with straighter sides, in the ♀.

♂. Deep yellow, inclining to orange. Elytra with the costa generally, and the inner margin sometimes, narrowly reddish, membrane and some wedge-shaped spots on the corium hyaline. Posterior tibiæ generally tinged with pink; anterior and intermediate tarsi sometimes, and all the claws always, fuscous. Genital style with three branches at the apex, of which one, the lower, is three-pointed, and the other two are bifid (fig. a).

♀. Pale whitish-yellow. Membrane very faintly tinged with fuscous. Tarsi and claws as in the ♂. Length, $1\frac{3}{4}$ lines.

Figures *b* and *c* show the structure of the genital style in the ♂ of *T. rosæ* and *T. Douglasi* respectively.

Mr. Douglas' specimens were from maple and lime, while I took most of mine on the trunks of black poplars.

ON FEMALE DIMORPHISM OF *PALTOSTOMA TORRENTIUM*.

BY DR. FRITZ MÜLLER.

As there seems to be some hesitation in accepting the female dimorphism of *Paltostoma torrentium* (see Ent. Mo. Mag., xvii, p. 130), I will here very briefly state the facts which seem to me to prove that the two sets of females belong to the same species.

First as to the sex of the three forms of *Paltostoma*. Were it not for Baron Osten-Sacken saying that "error may easily occur," I should have thought it quite unnecessary explicitly to state, that I ascertained the sex by examining the internal sexual organs; the females of either set have three dark brown pear-shaped *receptacula seminis*; the eggs, in nearly ripe pupæ, are 0.5 mm. long, 0.13 mm. thick, one side being more convex and one end a little more obtuse than the other.

Had the males and the two sets of females been caught at the same locality, it would indeed have been rash to consider the females (widely differing in the organs of the mouth, the size of the eyes, and the structure of the last tarsal joints) as belonging to the same species. But the case is quite different. In the rapids of some of our rivulets the larvæ and pupæ of *Paltostoma* are extremely frequent, and may be collected in large numbers. Thus I have been able carefully to compare and to dissect hundreds of them; but I have not discovered any differences corresponding to the three sets of flies. From the pupæ I have extracted repeatedly numerous flies, and have always met with two sets of females, and never with more than one set of males. The two sexes seem to occur in about equal numbers. One day from 70 pupæ I extracted 20 males and 20 females, and of these 13 had small eyes, short claws, and no mandibles, whereas 7 were provided with mandibles, and had large eyes and long claws. *The structure of the external sexual organs* (as already stated in my article in "Kosmos") *is quite the same in the two sets of females*, and this would hardly be the case, if they belonged to different species.

If the two sets of females belonged to two distinct species, unavoidably one of the two following equally unacceptable assumptions must be admitted: the males of one of the two species either must be extremely rare, so that among very numerous females I never saw them, or their larvæ and pupæ must live in different localities and under quite different conditions; the latter assumption is the more improbable, as the larvæ of *Paltostoma* are wonderfully adapted to inhabiting rapids.

I may add, that I placed the fly in the genus *Paltostoma* on the authority of Professor Brauer, of Vienna, who is also responsible for the statement, that a species of that genus has been found on Monte Rosa (see Zoolog. Anzeiger, No. 51, p. 134). I have never ventured any assumption about the eyes of other *Blepharoceridæ*, of which I know absolutely nothing; in the passage alluded to by Baron Osten-Sacken, I simply refer to many "other male insects" ("männchen anderer Kerfe").

A full account of the metamorphosis of *Paltostoma torrentium*, and of the very interesting anatomy of the larva, has been sent for publication to the "Archivos do Museu Nacional do Rio de Janeiro."

Blumenau, Sa Catharina, Brazil:
December 13th, 1880.

CHARACTERS OF NEW GENERA AND DESCRIPTIONS OF NEW SPECIES OF *GEODEPHAGA* FROM THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

(Resumed from vol. xvi, p. 109).

IV.

The following species, together with examples of most of those taken in February, 1878, occurred to me in April and May, 1880, during a short visit to Haleakala, Maui.

The addition of fresh material to my series, and a consequent re-examination of the Hawaiian species of *Cyclothorax*, has led me to the conclusion that in my descriptions of *C. scaritoides*, *cordaticollis*, *Deverilli*, and *vulcanus*, the term "subcordatus" applied to the prothorax is misleading, and that "cordatus" should be substituted for it. In a batch of specimens, taken in company, of almost any of the Hawaiian *Geodephaga*, one or two examples will generally be found to differ slightly in sculpture from the rest. How to account for this fact I know not, but a fact it is; and, unfortunately, the species mentioned above were described on specimens that (I have since discovered) were not ordinary types. In other respects, however, the descriptions may stand.

ANCHOMENIDÆ.

DISENOCHUS.

[In characterizing this genus (Ent. Mo. Mag., vol. xv, p. 121), I accidentally omitted reference to the eyes. They are only slightly convex, and as indistinctly faceted as those of *Blackburnia insignis* and *blaptoides*.]

D. TEREBRATUS, sp. nov.

Convexus, nitidus, niger, antennis palpisque rufis, pedibus (præcipue genibus tarsisque) plus minusve rufescentibus; prothorace transverso, antice vix emarginato, postice fortius angustato, basi utrinque impresso, angulis posticis rotundatis, lateribus fortius rotundatis angustissime marginatis, margine reflexo trans basin deficiente; elytris oblongis fortiter striatis, striis parcius profunde punctatis, apicem versus obsoletis, interstitiis angustis, humeris rotundatis, metasterno punctato.

Long. 8 mm.

Haleakala, Maui. Several examples occurred under stones at an elevation of about 4000 feet.

This insect is readily distinguished from *D. anomalus* by the following characters:—The thorax is considerably narrowed behind, and has the base unmarginated; the elytra are much narrower than those of *anomalus*, and the striæ are much more sparingly and coarsely punctured. The rather coarsely punctured metasternum also differentiates it.

ANCHOMENUS.**A. PUTEALIS, sp. nov.**

(*A. meticuloso affinis*). *Subnitidus, niger, nonnullis exemplis marginibus apiceque rufescentibus, mandibulis palpis antennis pedibusque plus minusve rufescentibus; capite magno; oculis magnis convexis; antennis corporis dimidio paululum brevioribus; prothorace transverso subcordato canaliculato, antice parum emarginato, basi utrinque fortiter foreolato, lateribus parum rotundatis, angulis posticis fere rectis; elytris elongato-ovalibus, parum convexis, fortiter striatis, interstitiis vix convexis, humeris prominulis; tarsorum articulo quarto haud emarginato.*

Long. 7½—8 mm.

In damp rotting leaves on the margins of a stagnant pool, at an elevation of about 4000 feet, on Haleakala, Maui.

CYCLOTHORAX.**C. UNCTUS, sp. nov.**

Parum convexus, nitidus, nigro-æneus, antennis palpis pedibusque lividis; capite mediocri, oculis prominulis, antennis corporis dimidio brevioribus; prothorace cordato, sat fortiter transverso rotundatoque, leviter canaliculato, antice leviter emarginato, trans basin sparsim punctato, angulis posticis acute rectis; elytris ovatis, striâ internâ integrâ fortiter impressâ antice punctatâ, secundâ integrâ leviter impressâ distincte punctatâ, striarum cæteris (marginali exceptâ) obscure adumbratis (nonnullis exemplis penitus oblitteratis), humeris rotundatis.

Long. 5¾—6¼ mm.

In company with *A. putealis*.

This species is allied to *C. cordaticollis*, *Deverilli*, and *vulcanus*. It is considerably larger, broader, and less convex than *cordaticollis*;

very much broader and less convex than *Deverilli*, and very differently striated, &c.; the strongly rounded thorax, superior size, different colour, &c., distinguish it readily from *vulcanus*.

C. LÆTUS, *sp. nov.*

Convexus, nitidus, nigro-brunneus ad æneum accedens, antennis palpis pedibusque ferrugineis vel rufo testaceis; capite mediocri, oculis prominulis; antennis corporis dimidio multo brevioribus, submoniliformibus; prothorace transverso, cordato, canaliculato, antice fere truncato, trans basin sparsim punctato, angulis posticis rectis; elytris ovalibus, subtiliter striatis, striis externis subtilioribus, striis antice subtiliter punctatis, humeris rotundatis.

Long. $4\frac{3}{4}$ —5 mm.

Haleakala, Maui; under stones, &c., at an elevation of about 4000 ft.

Another species of the *cordaticollis* group, nearest, I think, to *vulcanus*; it may, however, be easily distinguished from all its allies by the shortness of its antennæ, which, when set back, will not quite reach the base of the scutellum.

C. ROBUSTUS, *sp. nov.*

Fortiter convexus, subnitidus, obscure viridi-æneus, antennis palpis pedibusque rufo-piceis; capite mediocri, oculis prominulis; antennis corporis dimidio brevioribus; prothorace transverso, cordato, canaliculato, antice fere truncato, basi utrinque foveolato, trans basin punctato, angulis posticis rectis (nec abrupte); elytris ovatis, fortiter regulariterque striatis, striis antice obscure punctatis, humeris prominulis.

Long. 6 mm.

A single specimen occurred to me in moss, at an elevation of about 4000 feet, on Haleakala, Maui.

This species is not very close to any other with which I am acquainted. The combination of strong regular striation with great convexity separates it from all its congeners with the thorax of cordate form.

SEMBIDIIDÆ.

SEMBIDIUM (NOTAPHUS).

B. SPURCUM, *sp. nov.*

Minus convexus, nigrum ad cupreum accedens, antennis palpis pedibus et elytrorum maculâ posticâ plus minusve rufescentibus; capite mediocri, oculis parum convexis, antennis corporis dimidio longioribus; prothorace transverso, cordato, leviter canaliculato, antice emarginato, basi lato, utrinque foveolato, angulis posticis rectis; elytris oblongis, minus fortiter punctato-striatis, interstitiis planis, humeris rotundatis.

Long. $4\frac{3}{4}$ mm.

Haleakala, Maui; in decaying leaves, at an elevation of about 4000 feet.

The shape of the thorax separates this insect widely from the other Hawaiian species of *Bembidium* known to me. Compared with *B. flammulatum*, Clair. (which it resembles), it is smaller and differently coloured, with the elytra less strongly striated, the striæ much more conspicuously punctured and slightly tending to become fainter at the extreme apex.

(*LOPHA*).

B. TERES, *sp. nov.*

Parum convexum, viridi-æneum, antennis palpis pedibusque piceis (plus minusve rufescentibus); capite mediocri, oculis fortiter convexis, antennis corporis dimidio longioribus; prothorace leviter transverso, cordato, obsolete canaliculato, antice leviter emarginato, trans basin obscure rugato, angulis posticis subrectis; elytris oblongis, sat fortiter striatis, striis subtiliter punctatis, apicem versus evanescentibus, humeris rotundatis. Long. 5 mm.

Haleakala, Maui; in decaying leaves, at an elevation of about 4000 feet.

The larger size, longer antennæ, more elongate and less convex form, &c., readily distinguish this species from *B. pacificum*.

Honolulu: November, 1880.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

IV. LEPIDOPTERA (*continued*).

MICRO-LEPIDOPTERA (EXCEPT *TINEINA*) COLLECTED BY THE REV. A. E. EATON IN 1880, WITH DESCRIPTIONS OF NEW SPECIES.

BY E. L. RAGONOT.

PYRALIDINA.

PYRALIDIDÆ.

* *Herminia grisealis*, S. V., Hüb.—One, April 30th, Parque da Peña, Cintra.

Cledeobia moldavica, Esp. (*netricalis*, Hüb.).—One ♀, May 8th, hills south-west of Almodovar; one, *var. diffidalis*, Gn., June 25th, near Villa Real.

Asopia farinalis, L.—One, May 16th, near Silves.

Scoparia frequentella, Stn.—One, June 25th, in a vineyard near Villa Real.

S. angustea, Stph. (*coarctata*, Z.).—One, April 25th, on the hill side, valley of Alcantara.

* The Classification adopted is that of Staudinger and Wocke's Catalogue, 1871.

Threnodes pollinalis, S. V., var. *guttulalis*, H.-S.—One, June 8th, at Cea.

Botys aurata, Sc. (*punicealis*, S. V.).—One, May 17th, hill south of Silves.

B. asinalis, Hüb.—One, April 30th, Parque da Peña, Cintra.

B. ferrugalis, Hüb.—One, May 15th, vineyard north of Silves.

Nomophila noctuella, S. V. (*hybridalis*, Hüb.).—One, May 31st, on the road to Cintra.

Stenia fuscocilialis, n. sp.—One fine example, May 17th, taken on a hill south of Silves.

This specimen (a ♀) differs from *punctalis*, S. V., by its larger size (25 millimètres), more elongate (therefore less triangular) fore-wings, which are of a dark, rich, reddish-ochreous-brown. The head, palpi, thorax and abdomen are reddish-ochreous throughout, whilst in *punctalis* the palpi are distinctly white beneath. The under-side of the wings is much darker than in *punctalis*, and the reniform stigma more distinct.

A second specimen, much worn, was taken on May 14th between São Bartholomeu do Messines and Silves.

CRAMBIDÆ.

Crambus craterellus, Sc. (*rorella*, L.).—Two specimens of the var. *cassentiniellus*, Z., May 11th, near Almodovar.

C. pratellus, L., var. *alfacarellus*, Stgr.—In this variety the fore-wings are rather broader, the second line is less angulated than in *pratellus*, and the ground colour is white, as in the ♀ of *pratellus*.

PHYCIDEÆ.

Pempelia satureiella, Mill.—A ♀ in very wasted condition, hardly distinguishable, May 16th, hill south-east of Silves. M. Millière places this species in error in the genus *Nephopteryx*, for the ♂ has pencil-like maxillary palpi, and the median vein of the hind-wings being trifid, show that the true position of *satureiella*, Mill., is after *integrella*, Stgr.

Asarta rubricosella, Stgr.—One, June 22nd, captured along a torrent at upwards of 2480 feet, on a mountain N.W. of Villa Real.

This specimen is much darker than a type from Castile; it is nearly black, and the fasciæ are very indistinct, the hind-wings blackish-brown.

Wocke in his Catalogue sinks *rubricosella*, Stgr., as well as *alpicolella*, Z., into varieties of *æthiopella*, Dup., but they are all three very distinct species, and it is impossible to confuse them.

Ethiopella is the smallest species, the wings are short, rounded on the costa and hind margin, the fasciæ are very sinuous, the discal spot distinct.

Rubricosella has more elongate wings, the apex is rather acute, the costa and hind margin straight, the bands are nearly straight, and there are two distinct blackish triangular spots, one on the inner margin before the first fascia, and the other on the costa just after the same fascia, but there is no discal spot.

Alpicolella resembles in form and markings *rubricosella*, but it is larger and more suffused with pale yellowish scales, the head in front is distinctly pale yellowish, the hind-wings are pale grey, whitish on the costa, the triangular markings are more sharply defined on the fore-wings, and the under-side of both wings is whitish.

Episcchnia illotella, Z.—One, May 16th, on the hill S.E. of Silves.

Acrobasis glycerella, Stgr.—One, May 6th, near a stream at Almodovar.

Euzophera polyxenella, Mill. (M. Millière places this species in error in the genus *Ephestia*).—One, June 12th, taken at Ponte de Morcellos.

Homœosoma nimbella, Z.—One, May 7th, on the hill south of Silves.

TORTRICINA.

Teras logiana, S. V. (*tristana*, Hüb.).—One, May 20th, with the ground colour nearly white, resembling pretty exactly fig. 64 of Hübner, captured on the slopes of Picota, high up the stream at 1600 to 1700 feet.

Tortrix amplana, Hüb. (fig. 201, not 157 as quoted by Dr. Wocke).—One ♀, captured on April 25th in the valley of Alcantara, near Lisbon.

T. Eatoniana, n. sp.

Al. exp. 16 mm. Fore-wings rather elongate, arched at the base, the hind margin oblique. The ground colour is pale fulvous, lustrous, with a darker reticulation and suffused sometimes with reddish-ochreous; from the middle of the costa proceeds a blackish oblique fascia, which is straight to near the anal angle, where it becomes rounded.

On the costa before the apex is a blackish triangular patch, and there is a minute blackish spot on the inner margin not far from the base; sometimes the fascia is interrupted before the fold, and does not reach the inner margin.

Hind-wings greyish, indistinctly reticulated with fuscous on the upper-side, but distinctly so underneath. The fringes are all pale fulvous.

Head and thorax above reddish-ochreous, the front of the head fuscous. The antennæ are slightly serrate and pubescent in the ♂.

Eatoniana belongs to the sub-genus *Lophoderus*, all the nervures being separate, the costa not folded in the ♂, and the apex not produced. Its position would be between *politana*, Haw., and *cinctana*, S. V. It has a great resemblance to *unifasciana*, Dup.

Two ♂ captured, one, April 24th, near Lisbon, at Olivaes ; and the other, June 12th, at Ponte de Morcellos.

Sciaphila Wahlbomiana, L., var. *communana*, H.-S.—One, May 9th, at Almodovar ; and another, May 16th, on the hill S.E. of Silves. They have both a leaden-grey ground colour, the markings are hardly darker and but faintly outlined.

Cochylis respirantana, Stgr.

Al. exp. 15 mm. Fore-wings rather elongate, the costa straight, the apex acute ; the ground colour is pale yellowish-white, somewhat silvery and crossed by numerous irregular olive-yellow patches or spots, in which are more or less numerous fuscous scales, especially in the ♀. These spots form ill-defined, interrupted curved bands, the most distinct of which arise from the inner margin, one nearly in the middle, another from the anal angle, and the third along the hind margin. The costa is spotted with fuscous to the middle. The fringes are pale yellowish. Beneath, the fore-wings are blackish-brown, save the fringes, which are yellowish.

The hind-wings are fuscous above and paler on the under-side ; the fringes are white. Head, thorax and palpi pale yellowish above and olive-yellow on the sides. The antennæ are pale brown, simple in the ♀ and pubescent in the ♂,

This new species, which has lately been published by Dr. Staudinger (*Horæ Rossicæ*, 1880, xv, Sep. abd. p. 88), resembles *dubrisana* very much (next to which species I would place it) in its markings, but differs by its colour, size, shape, and the absence of reticulations on the hind-wings, which are similar in colour in both sexes.

Dr. Staudinger has received it from Amasia, and has also taken it this year at Chiclana in Andalusia.

One ♀, May 16th, on a hill S.E. of Silves.*

Penthina (Sericoris) lacunana, Dup.—One, June 6th, at Cea. It has the median band much blacker than usual, and in the middle of the band the round spot is conspicuously light. A second example was captured in the same locality, but instead of the ground colour being olivaceous, it is reddish-fuscous like *cespitana*, with numerous lines and markings dark brown.

* I may mention here another Portuguese *Cochylis*, of which I have a specimen taken at Braganza by M. Manuel d'Oliviera.

Cochylis punctiferana, n. sp. Al. exp. 7 mill. Fore-wings much suffused with brownish-grey, leaving but little of the whitish ground colour. The base, a rather broad fascia, which begins on the costa nearly in the middle, going straight down to the median vein, then slanting towards the base and ending straight on the inner margin from the dorsal vein, and a large triangular spot on the inner margin before the anal angle, are dark greyish-brown. Between the fascia and the spot on the inner margin is a narrow white space. At the end of the median vein there is a very distinct round blackish dot surrounded with whitish ; above on the costa is a small brown spot, beyond which there are two others forming a semicircle, below which there is a pale brownish cloud parallel with the hind margin. Before the apex is another small brown spot, and the fringes, which are white, are distinctly chequered above and beneath with large brownish spots at the base and extremity. The under-side is blackish-brown, spotted with dark brown on the whitish costa.

The hind-wings are dark brownish-grey above and lighter beneath, the fringes white.

This new species I place between *coagulana*, Christ., and *reversana*, Stgr., but the large size of the triangular anal patch and the discal spot distinguish it easily from all the allied species.

Grapholitha sordicomana, Stgr.—Four ♂, May 6th, at Almodovar, but all much wasted; two are suffused with reddish, especially towards the costa. The whitish colour of the hind-wings beneath is very characteristic of this species.

Dr. Wocke, in noting for his Catalogue the species described in Herrich-Schäffer's "Neue Schmetterlinge aus Europa, &c.," has omitted this (p. 15, fig. 94), with quite a number of others; I mention this for those who possess this useful work.

G. succedana, S. V. (*ulicetana*, Haw.).—Two, April 30th, in the Parque da Peña, near Cintra; one with the uniform grey ground in the variety named *micaceana* (Constant).

G. coniferana, Ratz.—One, June 14th, on the hill side opposite Ponte de Morcellos.

Phoxopteryx diminutana, Haw.—One, June 11th, near Cea.

PTEROPHORINA.

Amblyptilia acanthodactyla, Hüb.—One, May 8th, on the hill S. W. of Almodovar.

Leioptilus osteodactylus, Z.—One, May 14th, near Silves.

Aciptilia icterodactylus, Mann.—One, much wasted, June 24th, on the hills to the west of Villa Real.

To finish, I must express here my best thanks to the Rev. A. E. Eaton for having kindly authorized me to retain for my collection the specimens which interested me.

12, Quai de la Rapée, Paris :
November 20th, 1880.

DIAGNOSES QUATUOR NOVARUM PENTATOMIDARUM.

SCRIPTISIT DR. O. M. REUTER.

CARBULA AMURENSIS.

C. humigeræ, Uhler, *magnitudine coloreque simillima, pronoti angulis lateralibus obtusioribus haud in dentem productis et margine postico rectis, hoc margine inter costam et scutellum tantum paullulum brevior necnon scutelli apice magis attenuato, distincta.*

Habitat in Amuria.

CARBULA OBTUSANGULA.

Præcedenti valde similis, differt pronoto minus transverso, angulis lateralibus adhuc obtusioribus, apice ipso distincte obtusis, margine antico laterali versus angulum fortius arcuato; antennarum articulo quarto versus apicem fuscescente, quinto fusco, versus basin pallido, nec non segmentis connexivi tantum angulo apicali, macula parvula nigra, signatis, basali puncto nigro destitutis.

Habitat in China.

EDESSE FUSCIDORSATA.

E. saturatæ, Dall., *affinis*, differt cornubus pronoti fere paullulum longioribus, dorso abdominis fusco, connexivi angulis multo latius nigris, macula media inter has, angusta, lutea, ventre obscure olivaceo-brunneo, colore superne obscure viridi.

Habitat in Mexico et Bogota.

ASPONGOPUS NIGROÆNEUS.

Totus nigro-æneus; capite, pronoto et scutello dense subtiliter punctatis, rugis transversis obsoletis; capitis lateribus distincte sinuatis; antennis articulo secundo primo paullo magis quam dimidio longiore, secundo et tertio compressis, hoc illo distincte longiore (ultimi desunt); corio margine apicali leviter rotundato; prosterno medio triangulariter impresso, marginibus impressionis vix reflexis. Long. $16\frac{1}{3}$ mm. Ab A. ochreo, Westw., colore, prosterni impressione minus profunda, punctura densiore, rugis vix distinguendis divergens.

Habitat in Siam.

Helsingfors: January 21st, 1881.

Captures of Hemiptera in 1880.—During a three-weeks' stay last August at Wymondley, Herts, I found bugs by far the most abundant of all Orders. Nettles yielded the following species in the utmost profusion:—*Scolopostethus affinis*, *Lygus pabulinus*, *Spinolæ* and *Kalmii*, *Byrsoptera rufifrons*, *Orthotylus Scotti*, *Heterotoma merioptera*, *Plagiognathus arbustorum*, and *Anthocoris nemorum*; while *Sehirus bicolor*, *Phytocoris ulmi*, *Capsus lanarius* and *Liocoris tripustulatus*, occurred commonly. *Megalocera longicornis* was common amongst coarse herbage, but *M. erratica* was conspicuous by its almost total absence in either larval or perfect form. Of the handsome genus *Calocoris*, besides *C. roseomaculatus* and *bipunctatus*, I took 2 *fulvomaculatus*, 1 *sexguttatus*, 1 *infusus*, and a few *chenopodii*, all by sweeping. *Ononis* yielded *Dicyphus annulatus* commonly and a few *Macrocoleus Paykullii*. On *Epilobium hirsutum* I found in great abundance a pale green *Dicyphus*, which Mr. Edward Saunders tells me is *D. stachydis*, Reut.; I have since found it on the same plant at Hastings. A small patch, a few square yards in extent, in a flowery meadow on the chalk near Stevenage, yielded, besides a lot of ordinary things, *Halticus apterus*, *Orthocephalus saltator*, *Anoterops setulosus*, *Macrocoleus molliculus*, *Megalocera ruficornis*, plenty of *Calocoris roseomaculatus*, and immense numbers of *Monanthia cardui*, the thistle-heads being absolutely swarming with the last, in all its stages. A larch plantation afforded 1 *Atractotomus magnicornis*, Fall., and several *Tetrableps vittata*, larval and adult. Amongst other things may be mentioned *Malacocoris chlorizans*, very common on hazel; *Triphleps minuta*, abundant by sweeping; 1 ♀ *Microphysa elegantula*, on lime-bark; 1 *Pæiloscytus nigrinus*, 1 *Orthotylus bilineatus*, and a few *Chlamydatus ambulans*, *Campyloneura virgula*, *Nabis brevipennis*, *Dictyonota crassicornis*, and *Derephysia foliacea*. I am indebted to Mr. Edward Saunders for the names of some of the above. At Battle, near Hastings, *Strachia festiva* was common in September,

though we have never seen it at Hastings. From Eastbourne Miss R. M. Sothcy sent me a specimen of *Rhacognathus punctatus*, and I received *Coranus subapterus* from Deal.—E. A. BUTLER, University Lower School, Hastings: Feb. 14th, 1881.

Notes on Coleoptera in the Isle of Wight.—Last spring, during a few days' stay at Ventnor, I obtained a good many specimens of *Lithocharis maritima* (first recorded as British from this locality by Mr. Guyon). I found the first specimen by accident, while searching for *Limnæum nigropiceum* which was fairly plentiful. At first I took the *Lithocharis* very sparingly, but afterwards, on acquiring a knowledge of its habits, I succeeded on one occasion in getting about two dozen in less than an hour. *Philonthus xantholoma* swarmed in the same locality, a considerable number of the var. *variolosus* with abnormally developed heads being among them. *Philonthus fucicola* was to be got, but sparingly, and also *Philonthus sericeus*, and *Homalota vestita*, *plumbea*, and *puncticeps*.

Dianous and *Stenus guttula* can always be found under the moss in the stream that runs down to the beach a little to the west of the town. I failed, however, to find *Trechus lapidosus* under the stones near the same place, though I secured a few there two years before.

At Sandown I found several *Harpalus parallelus*, and other common *Harpali* (such as *rotundicollis*, *rubripes*, &c.) in abundance; also *Ceuthorhynchus rugulosus*, *Ceuthorhynchideus Dawsoni*, and *Apion confluens* (the latter in profusion, always in company with *Olibrus æneus*) on and at the roots of plants growing in the sand.

I tried Black Gang Chine one day, but failed to get any beetles worth mentioning except *Apion striatum* and *Philorhinum humile*, both in abundance, off furze.

There was a bitter east wind blowing all the time I was in the Island, which rendered sweeping and beating out of the question, except in unusually sheltered spots.—W. W. FOWLER, Lincoln: February 2nd, 1881.

Colorado Beetles in Devonshire.—In the House of Commons, on the 11th inst., Mr. Borlase asked the Secretary of State for the House Department whether his attention had been called to the evidence adduced at the Yealmpton Police-court, with regard to the discovery of Colorado beetles in South Devon; and Mr. Mundella said he had been requested to answer this question, Colorado beetles being in his department. The history of the case referred to was as follows:—On the 5th inst. the deputy chief constable of Devon telegraphed to the clerk of the Council that a man near Plymouth was in possession of some live Colorado beetles, which he refused to give up, that there was no power to apprehend, and asked for instructions. A telegraphic reply was immediately sent to the effect that the Destructive Insects' Act of 1877, and the order passed under that Act, provided for the imposition of penalties in such cases. Copies of the Act and order were forwarded to him by that night's post. On the 7th inst. the Home Office sent us a letter from the clerk of the justices of the Petty Sessions Division on the subject. We gave him the same information as was given to the deputy chief constable. On the 10th inst. we received an intimation that the defendant had been convicted and fined £5, the maximum penalty of £10 having been mitigated, as he pleaded ignorance of the law, and proved that the beetles had been destroyed.

[From the "Gardeners' Chronicle" for February 19th, 1881. We understand

the beetles were brought alive from America by their possessor; the Devonshire farmers are said to be much dissatisfied at the small amount of the fine.—EDS.]

Prices of rare exotic Coleoptera.—At the sale at Stevens's rooms on the 11th February, of the collection of *Coleoptera* formed by the late Mr. J. Aspinall Turner (formerly M.P. for Manchester), the following prices were obtained for some of the most conspicuous lots. Lot 61, consisting of 2 *Euchirus Dupontianus*, 2 *E. Macleayi*, 3 *E. Cantori*, and 3 *E. Hardwickii*, realized £8. Lot 91, 2 fine *Goliathus giganteus*, sold for £7. Lot 92, 1 *G. giganteus*, 1 fine *G. Kirkii*, ♂, and 1 probable variety of the ♀ of *G. cacicus*, sold for £20. Lot 95, a fine and perfect *Ischnoscelis Dohrni*, fetched £10. Lot 96, 1 *I. Dohrni* and 7 *Ceratorrhina setulosa*, fetched £7. Lot 97, a fine pair of *Goliathus Fornassinii*, realized £24. Lot 101, 1 *Ceratorrhina Savagei* and 2 *C. Polyphemus*, sold for £5 10s. Lot 149, *Hypocephalus paradoxus*, sold for £10. Lot 154, a pair of *Macrotoma Hayesii* and other good *Prionidæ*, realized £8. The general opinion appeared to be that rarities fetched extreme prices, whereas fine sets of more ordinary species sold very cheaply.

Notes on Mr. Saunders' Synopsis of British Heterogyna and Fossorial Hymenoptera.—

Tapinoma polita, Smith. Bournemouth; one specimen (♀), J. C. Dale. Not Wales. The late Mr. Smith misread Bournemouth as Barmouth.

Additional localities—

Ponera contracta, Latr. Ventnor, Deal, C. W. Dale.

Leptothorax acervorum, Fab., appears to me to be as much a southern as a northern species, as it is common in both Hampshire and Dorsetshire.

L. unifasciata, Latr. Rare. Isle of Wight, Seaton, Portland, and Lulworth, C. W. Dale. Not Sherborne.

Myrmecina Latreillei, Curt. Several places in Dorsetshire and Hampshire.

Aporus unicolor, Spin. Very rare. Middlemarsh, Dorset: one, J. C. Dale, 1835.

Priocnemis hyalinatus, Fab. Parley Heath.

Agenia variegata, Linn. Rare. Glanvilles Wootton, Portland.

Didineis brevicornis, Fab. Bristol, Walcot; Glanvilles Wootton, Lulworth, Dale.

Crabro aphidum, St. Farg. Herne, Hants, J. C. Dale, ♂ ♀, July 25th, 1842.

C. signatus, Panz. Glanvilles Wootton, ♂, C. W. Dale, June 20th, 1867.

Oxybelus mandibularis, Dbm. Appledore, Devon, J. C. Dale, July 21st, 1831.

—C. W. DALE, Glanvilles Wootton, Sherborne, Dorset: February, 1881.

An Ichneumon new to Britain (Mesolius rufilabris).—At Wymondley I took, in August, two specimens of a fine ichneumon which Mr. Fitch has named for me, *Mesolius rufilabris*, Zett., new to Britain.—E. A. BUTLER, Hastings: February 14th, 1881.

Ophion minutum at Hastings.—I have to record the capture of a specimen of *Ophion minutum* (vide The Entomologist, vol. xiii, p. 54), at Hastings during the past season. It has been identified by Mr. Fitch.—F. WALTER SAVAGE, University School, Hastings: February, 1881.

Vespa norvegica in Yorkshire.—On August 11th last, while collecting *Coleoptera* on umbelliferous plants at Stamford Bridge near York, I captured a specimen of *Vespa norvegica*.—W. W. FOWLER, Lincoln: *February 8th*, 1881.

Ornithoptera Brookeana, Wall.—This handsome butterfly, which was first described by Mr. Wallace in 1855, and discovered by him in the neighbourhood of Saráwak, is still, especially the female, not a common insect in collections, but, from recent information, it appears to have a much wider habitat than is usually understood, and, therefore, also likely before long to be estimated as a much less rare insect by Lepidopterists. Of its having but a limited range in Borneo it would be somewhat rash to predicate. From Saráwak, where originally found, it extends northwards to Sandakan where it has been captured by Mr. W. B. Pryer, and was seen in N.W. Borneo, near Mt. Kina Balu, by Mr. Burbidge, "Gardens of the Sun," p. 260. This author records it as being seen in considerable numbers: "These delicate insects are generally most numerous by rivers, or in sunny places by the dry beds of streams, and, singularly enough, are most abundant during the cool wet monsoon." It is also found in Sumatra, Vollenhoven having described and figured it from that Island under the name of *P. Trogon*. In the Proc. Roy. Geog. Soc., vol. ii, p. 634, it is recorded that Mr. Leech found this butterfly "plentifully in several places" in Eastern Pêrak. It is thus found in Malacca, Sumatra, and Borneo, but we may almost absolutely say not in Java, and thus agrees with the many other zoological coincidences which prompted Mr. Wallace some years since to propound the theory "that subsequent to the separation of Java, Borneo became almost entirely submerged, and on its re-elevation was for a time connected with the Malay Peninsula and Sumatra, but not with Java or Siam." Most of the described *Ornithoptera* are now in collections; *O. Urvilliana* has recently been received from Duke of York's Island, and the greatest rarity and desideratum that remains is *O. Tithonus*, De Haan, which was described and figured in 1840.—W. L. DISTANT, East Dulwich: *January 22nd*, 1881.

Occurrence of Harpella bracteella near Hartlepool.—Mr. J. E. Robson, of Hartlepool, took a specimen of this rare Micro., in his garden, last summer. The insect flew to light, which was put in his summer-house for the purpose of attracting moths. It is in rather poor condition, but a most interesting capture, as giving a fresh locality for the species. The only other recorded captures are those near Gateshead, and the one at Crumlyn by Mr. Scott. Mr. Robson most kindly presented me with the specimen.—J. SANG, 6, Chestnut Street, Darlington: *January 25th*, 1881.

On the semi-looping habit of young larvæ of Noctuæ.—In reference to Mr. Stainton's remarks (*ante* p. 135) on the half-looping young larvæ of *Triphæna pronuba*, I have to state that, according to my experience, which has been pretty extensive in rearing from the egg, nearly all the larvæ of the *Trifidæ* are semi-loopers when first hatched. The *Cymatophoridæ* are an exception, but they are altogether abnormal, and somewhat allied to the *Tortricina*, the eggs being pear-shaped, and the larvæ living between united leaves and moulting only four times, while the normal number of moults in the *Trifidæ* is five.—R. F. LOGAN, Colinton, N.B.: *February 11th*, 1881.

Pempelia hostilis, &c., near Colchester.—I captured a worn specimen of *Pempelia hostilis* in 1879, and in the autumn of that year took several larvæ, but

only succeeded in breeding one specimen last June. On May 29th however, I took a lovely example by beating. I should have announced the capture of this rare species before, but could not fully satisfy myself about it and delayed submitting my specimen to a more competent authority. In the autumn of last year I again met with several larvæ, and hope to see the perfect insect in due course. It seems very scarce and local, for though aspen abounds in most of the larger woods hereabouts, I have only found *hostilis* in one locality, though I have searched for it well elsewhere.

At the end of last September, when beating oak, a considerable number of another "knot-horn" larva tumbled into my umbrella. These I at first hoped might be *Cryptoblabes bistrigella*, but they were so common that it struck me they might more probably be young larvæ of *Rhodophæa consociella*, which is abundant in the locality; I therefore only boxed about a dozen. Some of these were ichneumonised, but others became pupæ later on, thus proving that they could not be *consociella*, and driving me back to the conclusion that my first impression was most likely correct.

Bistrigella generally turns up here every season, but is always very rare in the perfect state. I also met last autumn with *Gymnancyla canella*, the larvæ of which were tenanted several plants of *Salsola kali* on a retired part of the Essex coast.—W. H. HARWOOD, 8, West Stockwell Street, Colechester: 14th February, 1881.

On the Stridulation of Acherontia.—Dr. Laboulbène takes exception, in the "Annales de la Société Entomologique de France" (5^{me} Série, t. vii [1877], Bull., p. 1v), in regard to my failing to quote a paper he had published on the stridulation of the Death's-Head Sphinx, when I, in reply to Mr. Moseley, tried to establish the mechanical nature of this sound in the Ent. Mo. Mag., vol. xiii, pp. 217—220. His experience is as follows:—"Eventually I wished to see in what manner the animal arranged the fan of hairs lying in the fold. This fold is formed of a dry rough skin (*comme scarieuse*), especially at the margin of the first segment where it rests on the second. I passed beneath this dry skin the blunt point of a little steel rod, and not only did I succeed in thus arranging the hairs, but, to my satisfaction, I heard a sound, feeble, but very similar to the cry of the living animal. I repeated the same manœuvre, by pressing on the skin behind the fold and a little higher up on the first segment, and every time I caused the hair to fall into its place almost invariably I elicited the cry. The reason of this appeared attributable to the contraction of the muscles as they shut the fold with its dry membrane, and perhaps also to the friction of the rough skin of the first abdominal segment on the second."

As the Death's-Head Sphinx has not been common in this district since the autumn of 1878, I have not been able to make further observations on its cry, but if the true sound can be elicited as Mons. Laboulbène would affirm, I perhaps may suggest that I find a much more suitable structure for its production in the hinder pieces of the meso-sternum, which on their inner surface are distinctly limaform.—A. H. SWINTON, Binfield House, Guildford: 3rd February, 1881.

Review.

A TREATISE ON COMPARATIVE EMBRYOLOGY: by FRANCIS M. BALFOUR, M.A., F.R.S., Fellow and Lecturer of Trinity College, Cambridge. 8vo, 2 vols. Vol. I, pp. v—vii, 1—492, and i—xxii. London: Macmillan & Co., 1880.

An extremely useful summary of what is known on this subject at the present time, judiciously arranged and well illustrated with woodcuts. Although Entomo-

logists, as a rule, are more familiar with Comparative Morphology than with Embryology, there is much in this volume well worthy of their consideration. Prefaced by a short Introduction (pp. 1—13) explanatory of the science and aims of Embryology, and describing the methods of animal reproduction in their general plan, the first three chapters treat of the ovum and spermatozoon, giving a general and special account of their formation, and of the development of the former up to the period of its segmentation after impregnation. The distinction drawn by Huxley between *ova* and *pseudova* is not adopted; and "the term nurse (German Amme) employed for the asexual generations in metagenesis, may advantageously be dropped altogether."

The remainder of the volume is occupied by Systematic Embryology, Part I, introduced by an explanation of what takes place in the ovum after segmentation has been completed, a chapter being devoted to the Embryology of each class of animals (excepting the classes of the Vertebrata, which are to form the subject of Part II in the second volume), in addition to chapters relating to animals whose affinities have not yet been exactly ascertained, the matter being discussed chiefly from an histological point of view. The chapters of most immediate interest to Entomological students extend from p. 316 to p. 452, and relate, XVII to *Tracheata*, XVIII to *Crustacea*, and XIX to *Pacilopoda*, *Pycnogonida*, *Pentatomida*, and *Tardigrada*, concluding with a summary of Arthropodan development.

At pp. 451—452, Mr. Balfour advances embryological reasons adverse to the opinion prevalent amongst Zoologists, that *Tracheata* and *Crustacea* are members of the same phylum, and maintains that the *Arthropoda* have a double phylum,—the *Tracheata* descended from a terrestrial Annelidan type related to *Peripatus*; and the *Crustacea* from a Phyllopod-like ancestor. In support of these, he adduces others based upon the anatomy of the animals in some particulars, pointing out that "the Crustacean appendages are typically biramous, while those of the *Tracheata* are never at any stage of development biramous." He does not admit that bi-flagellate antennæ in *Paupopus* (no other instances are cited) constitute an exception to this rule, maintaining (p. 337) that antennæ "can hardly be considered to have the same morphological value as the succeeding appendages. They are rather equivalent to paired processes of the præoral lobes of the chaetopoda;" or, if equivalent to appendages, they may correspond with the first pair of antennæ of *Crustacea*. This rule (that no appendages are biramous in *Tracheata*) having thus been conclusively decided, it might be unkind to enquire, what is to be done with the upper maxillæ of such creatures as *Lucanus*, for example? not to mention *Perlida*, &c., whose galea is jointless.

The author justly alleges (p. 451) that "the similarity between the appendages of some of the higher *Crustacea* and those of many *Tracheata* is an adaptive one, and could in no case be used as an argument for the affinity of the two groups;" whilst in respect of some other resemblances between them, they are due to "both groups being descendants of Annelidan ancestors." The similarity of the compound eyes in the two groups cannot, however, be explained in this way, and is one of the greatest difficulties of the above view.

In arguing against the supposition entertained by Gegenbaur and Lubbock, that in the *Ephemerida* and *Trichoptera* the tracheal gills are modifications of wings (p. 339), the strong point that these organs are in several instances developed

from the ventral region of the abdomen, the under-side of the thorax, and beneath the head from the hinder part of the basal joining of the upper maxilla, is not advanced by Mr. Balfour.

In fig. 188 A, illustrating aquatic respiration (after Gegenbaur) the original author's blunder over the name of the insect has been reproduced. The figure is a sketch of the abdomen of a nymph of *Cloëon rufulum* (the *Chloëon dimidiatum* of Lubbock's writings), the species being precisely indicated by a peculiarity in the form of its tails, whereby it is distinguishable from the other German species of the genus. It is named, however, *Ephemera vulgata*, an error which might have been avoided by reference to Pictet's Monograph. It is adding insult to injury to give bad names to an insect that has been subjected to the miseries of being drawn alive under the microscope; but it is a way some people have of showing their contempt for creatures not so large as whales, and not so small as mites. Very likely Gegenbaur, in the present instance, was misled by Wagner in "Isis" for 1832, pl. ii, 1.

Reasons are given (p. 376) for considering the antennæ to be unrepresented in *Arachnida*, the chelicerae being homologues of the mandibles, the pedipalpi answering to the 1st maxillæ, and the 1st pair of ambulatory limbs to the 2nd maxillæ of Insecta. The telson is reckoned as a segment.—A. E. EATON.

Obituary.

Gabriel Koch.—On the 22nd January, 1881, in the 74th year of his age, this Frankfort Entomologist departed this life. He had amassed a very fair collection of *Lepidoptera*, and from time to time had published sundry memoirs on this Order of insects—of these by far the most interesting is the 8vo volume of 154 pages, which appeared in 1854, on the Geographical Distribution of European *Lepidoptera* in other parts of the globe: "Die geographische Verbreitung der europäischen Schmetterlinge in andern Welttheilen, nebst statistischen Tabellen." This work was noticed at the time it appeared in the Entomologist's Annual for 1856, p. 153.

In 1856, Koch published a larger work extending to nearly 500 pages: "Die Schmetterlinge des südwestlichen Deutschlands, insbesondere der Umgegend von Frankfurt, Nassau und der Hessischen Staaten, nebst Angabe der Fundorte und Flugplätze." A work which no doubt has proved very useful to many a young collector in Western Germany.

His latest publication on the geographical distribution of *Lepidoptera* appeared in 1870, in Petermann's "Mittheilungen," as appears from the 8th volume of the Royal Society's Catalogue of Scientific Papers.

ENTOMOLOGICAL SOCIETY OF LONDON: Annual Meeting, 19th January, 1881.—Sir JOHN LUBBOCK, Bart., M.P., &c., in the Chair.

The following were elected Members of Council for the ensuing year, viz.:—Messrs. W. Cole, W. L. Distant, E. A. Fitch, F.L.S., F. Du Cane Godman, F.L.S., F. Grut, F.L.S., W. F. Kirby, R. Meldola, F.C.S., F. P. Pascoe, F.L.S., O. Salvin, M.A., F.R.S., E. Saunders, F.L.S., H. T. Stainton, F.R.S., R. Trimen, F.L.S., and Sir John Lubbock, Bart., M.P., &c.

The following Officers were subsequently elected: President, H. T. Stainton; Treasurer, E. Saunders; Librarian, F. Grut; Secretaries, E. A. Fitch and W. F. Kirby.

An Address was read by Sir J. Lubbock, the outgoing President, and the Meeting terminated with the usual votes of thanks to the Officers, &c.

TROPICAL NOTES.

BY W. B. PRYER.

I have lately been reading, with much interest, several descriptions of scenes, principally zoological, in the Far East, but I must say that, as a rule, I consider these descriptions overdrawn. There is, of course, a broad distinction to be made between writers of the Jules Verne school and gentlemen who are really describing what they have seen in the Tropics, but even these latter are nearly always too florid; again and again I have found people writing what they believe to be true, from which home-stayers in England would suppose that the scenes commonest in the Tropics are one gorgeous conglomeration of richly hued birds, the most beautiful exotic flowers, and troops of monkeys, while snakes, squirrels, palm trees, and, more particularly, butterflies—nearly every writer insists upon large quantities of gaily coloured butterflies—are thrown in *ad libitum*; Wallace very much put an end to the idea of the abundance of flowers in the tropical forest, and, of late years, there has been a noticeable falling off in their size, profusion, and colouring!; but most of the other things I have mentioned are still alluded to in undiminished numbers and gorgeousness.

Now, at this moment, I have “The Tropical Forest” before me; within one hundred yards of me, at this present moment of writing, commences a mighty forest, which may be traversed for a hundred miles without a vestige of human handiwork being met with, and what is it like? Simply, large quantities of straight tree-stems, running up like ships’-masts into the air, and terminating in a small mushroom-shaped head of leaves, and so thickly do the trees grow, that their heads are so closely packed together, as to form a dense canopy overhead, through which the sun can hardly find a chink to penetrate, and, accordingly, it is quite gloomy, cool, and damp below; as for monkeys, squirrels, birds, butterflies, palm trees, flowers, &c., there is simply not one visible.

Notwithstanding this, however, it does sometimes happen that one sees a good many birds in one place, in another, perhaps, a flock or two of monkeys, and, possibly, some other animal in another, a good many butterflies, and so forth; and it is but natural, perhaps, that writing afterwards while the usual uneventful every-day appearance of the Tropics is forgotten, these more beautiful and full-of-life scenes alone dwell in the memory, and are described as the usual thing.

Gifted with a good digestion and a stout pair of legs, there are, I daresay, few, if any, people who have wandered over the extreme

Far East more than I have ; and the most part of my journeyings have been on foot, or in small boats, and, as far as my experience goes, the Tropics cannot compare in the smallest degree with the temperate zone for profusion of butterflies, flowers, and birds. I have described in one of your back numbers (E. M. M., vol. xiv, p. 54) the azalea-clad hills of the Snowy Valley, in the "Central Flowery Land," and never anywhere throughout all my wanderings in tropical forests have I seen anything that in the slightest approached that Paradise for naturalists.

The forest of the Philippines is the most impressive I know, the canopy of leaves is thicker, and, therefore, the gloom below more intense, the air feels a chillier damp, and the absence of life and sound is more complete than in any other forest I have been in ; butterflies, in particular, are never found under the forest canopy. In Borneo, the canopy overhead is not quite so dense, the air is a trifle warmer, occasionally a monkey, a squirrel, or a bird may be seen, and, possibly, some errant specimen of the *Satyridæ* may be found wandering about even in the true forest. In Malaya proper there are lots of old re-grown clearings ; the air is a moist heat ; the vegetation is in huge masses, much more luxuriant than in either of the others ; and that feeling of mysterious awe, which is in reality the real attraction of the tropical forest, is not nearly so much felt. But wherever he may be going, the inexperienced entomologist in the Tropics must not expect too much at first, until he has found out the nooks and corners most frequented by his game, for butterflies in the Tropics are not to be found everywhere, but have their favourite places, as well as those in England. I remember my first day's entomologizing in North Borneo : no other insect-hunter had ever been within a couple of hundred miles of the place ; there was dense forest all round, the weather was fine, I was in the middle of the *Ornithoptera* country, and, armed with a net of most portentous dimensions, and with my head full of thoughts of two or three new *Papilios* at least, I plunged into the forest.

Three hours later I was back at the steamer again, a wiser, at all events, if not a better man, but anyhow, a pound or two lighter ! I had tried the open, and I had tried the forest ; I had penetrated into the depths of a mangrove swamp, and I had been bemired in a "nepa," then I tried the edge of the jungle, and afterwards some re-grown land, all in vain ! and, positively, when I got on board, my collecting box contained but one specimen of the universal *Melanitis Leda*, and a battered and washed-out *Neptis*, which looked as though it might have been the abundant *N. Eurynome* when fresh ; and these were the only

butterflies I had seen! An hour's sojourn beside a gorse bush on Hampstead Heath would have afforded more—and brighter coloured—specimens than this!

As for birds, Narseer and his brother, whose fame has been celebrated by Mr. Sharpe, and their boys, over a space of twenty days did not average more than two birds each a day; and yet the result when sent home has, I daresay, caused the casual observer to exclaim: "What an abundance of beautiful birds there must be in those parts!"

I do not know whether I am specially unfortunate, but once, and once only, in all my travels, did I see butterflies in anything like that profusion that most zoological travellers seem to consider the usual thing: it was in the centre of the Malay peninsula, at a place called Chindrass, a road had been made across a marsh, and at a rather damp place, the ground was simply covered with butterflies, busy sucking at the moisture; there were not many species, but the number of specimens was something enormous, the commonest was an orange-coloured, elongate-winged *Pieris* and a *Papilio*, closely allied to *P. Rhodamanthus*, was also in large numbers; looking over the lot I picked out a *Charaxes* as a desideratum, and, on popping the net over it, took about a dozen of the common *Pieris* as well, while a whole cloud rose into the air.

In one of these papers I have mentioned* notice is taken of the apparent scarcity of caterpillars in the Tropics; this is quite true, the same thing has struck me: beat, sweep, or look where you will, there are none to be found, but they are not far off all the same, for, plant vegetables on any newly-reclaimed piece of ground, and you will have the greatest difficulty in preventing their being destroyed by swarms of larvæ. We must fall back upon Darwin for the reason, I suppose; it is only those larvæ that are peculiarly gifted with modes of concealment that have any chance of surviving the continual search made after them by numerous enemies. Large quantities of larvæ entail large quantities of moths, and large quantities there are in some more favoured localities; in a very new clearing, where butterflies are almost absent, moths are usually very abundant, and this I ascribe to the bats, like the butterflies, not yet having found their way there; when first I opened up the jungle down here, the floor of the house was absolutely littered of a morning by the quantities of moths'-wings lying about; attracted from underneath the forest cover by the light, they had flown into the house which then had no windows or doors,

* Mr. Kirby's Translation of M. C. Pieper's remarks on the habits of butterflies in the East Indian Islands.

taken refuge in the "attaps," and there been eaten by numerous enemies of all orders, from hunting spiders to rats; there are plenty of bats flying about now, and I rarely see above half-a-dozen moths in an evening. Should any one wish to try this method of collecting, I would recommend him to make his clearing some four or five miles from any open space. I felled jungle, and made a little bungalow for myself at a place about half a mile from an old "campay," and expected to see lots of moths, but the bats found their way over at once; at first I had a few moths, eight or ten or so, fly in of an evening, even these were usually of the most insignificant looking character (though one, at least, was not: I enclose picture of it, which I shall be much obliged if the editors will name for me*), and latterly there were few or none at all.

When I came out here, the late Mr. Smith was anxious to know if I could get any information as to the reputed light-producing power of the *Fulgoridæ*. All my evidence is entirely to the negative; the Indians know no light-giving insect but the common fire-fly, and I have kept some of the family alive for days, and watched them closely, but have never seen the slightest luminosity about them.

With regard to the discussion at the Entomological Society on the 4th February, 1880, about fire-flies, Sir S. S. Saunders was entirely in the right; that the intermittent character of the fire-flies' light should be doubted would be looked upon by the poorest native with much the same amusement with which Englishmen hear Frenchmen aver that the sun never shines in England. The commonest observer on any of the most ordinary lines of travel cannot but notice this: a bush, generally some kind of low mangrove, will have thousands of fire-flies on it, and the nearest parts of the adjacent bushes, also within a radius of ten feet, will have their hundreds down to scores: their light all disappears and re-appears as though it was the action of one insect, a singular and most striking phenomenon. Mr. McLachlan seemed to think that fire-flies flew together in swarms, and, therefore, suggested the theory that a slight current of air altering the position of the whole swarm at once, so that their light-producing surface could not be seen, accounted for the supposed intermittancy. In the first place, I, at all events, have never seen fire-flies swarm when flying; as far as my own observations go, they always fly about singly. Secondly, place a fire-fly in any position you like, you cannot obscure its light; even if you wrapt it up in anything so that the portion of the body giving forth the light was even partially obscured, still the light would be visible.

* This drawing was not received.—EDS.

The flight of the fire-fly is somewhat flickering and uncertain, it seems to move about in an objectless sort of way, the light disappearing and re-appearing at intervals of less than a second, though sometimes they show the light for longer periods, and, occasionally, I notice that it is not extinguished at all. When running up a pane of glass, the alternations of light and darkness are very rapid, five or six times in a second. When two fire-flies happen to fly side by side for a short distance, their light is not simultaneous, nor is it, either, if only a dozen or so are scattered over one bush, to do it properly a whole congregation is required, then they sit down altogether, do not move, and produce and extinguish their light in unison, apparently for the fun of the thing.

Elopura, Borneo :
12th December, 1880.

DESCRIPTION OF A NEW SPECIES OF *LYCÆNIDÆ* FROM PENANG.

BY W. L. DISTANT, V.P.E.S.

IOLAUS (PURLISA) GIGANTEUS, n. sp.

Above, brilliant cerulean-blue. Anterior-wings: costal margin, to about one-third from base, broadly hoary-grey, remainder of costal margin, apical third and outer margin, dark fuscous. This dark fuscous portion occupies rather more than one-third of the wing, commencing at costa it is curved downwards past end of cell, gradually narrowing and terminating near posterior angle on inner margin. Posterior-wings bi-caudate, with the outer margin broadly dark fuscous, terminating at anal angle with a lunulate fuscous spot, irrorated with blue scales, outwardly margined with white, followed by the dark line separating the fringe, which is white. Tails fuscous, bordered with white fringe. Abdomen and inner margin of wings hoary and pilose.

Beneath, smoky-grey, both wings crossed by a submarginal narrow dark fascia, commencing about mid-way between end of cell and margin, which is sharply defined outwardly, and evanescent inwardly, waved, but entire on anterior-wing, but deeply sinuate towards apex of posterior-wing; a pale marginal border containing some obscure lunulate marks on anterior, and a double row of smoky sub-lunulate marks on posterior-wing; a black spot faintly margined with blue before base of first tail, and a larger spot of the same colour at anal angle. Fringe of the anterior-wings concolorous, of the posterior white.

Exp. of wings, 52 mm.

Hab.: Penang.

This fine species, which I have lately received from the above locality, was not known to me when collecting there a few years since. The only other specimen which I have seen is a mutilated one, without locality, which has been in the collection of Mr. F. Moore for the last twenty years, and which he tells me frequently excited the interest of himself and the late Mr. Hewitson. *Purlisa* is the name of a genus in MS., which Mr. Moore has proposed for the reception of this species,

Selston Villas, Derwent Grove, East Dulwich :
March, 1881.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

V. LEPIDOPTERA (*continued*).

MICRO-LEPIDOPTERA (TINEINA) COLLECTED BY THE REV. A. E. EATON IN 1880.

BY H. T. STAINTON, F.R.S.

TINEINA.

TINEIDÆ.

Tinea (Blabophanes) imella, Hüb.—One, April 24th, near Olivaes, in the environs of Lisbon.

Tinea fuscipunctella, Haw.—One, May 10th, in the estalagem at Almodovar.

T. pellionella, L.—One, June 11th, by the streamlet near Cea.

T. chrysopterella, H.-S.—One, rather worn, May 14th, between São Bartholomeu do Messines and Silves, by the road-side in cultivated lands.

Tinea (Tineola) crassicornella, Zell.—Two fine specimens, May 16th, hill S.E. of Silves, and May 17th, hill S. of Silves, amongst dwarf-oak in the evening.

Nemotois Latreillellus, Fab.—One ♂, in fine condition, May 23rd, on the hill-side, near São Marcos da Serra.

MICROPTERYGIDÆ.

Micropteryx mansuetella, Zell.—One, June 11th, by the streamlet near Cea.

HYPONOMEUTIDÆ.

Anesychia funerella, Fab.—One, June 29th, at the stream at bridge below Ruivães.

Prays Curtisellus, Donovan.—One, June 24th, hills to the west of Villa Real.

PLUTELLIDÆ.

Plutella cruciferarum, Zeller.—This ubiquitous insect is of course represented; one, May 5th, along the track from Casevel to Almodovar.

Cerostoma persicella, S. V.—One, June 8th, at Cea, in a wood.

GELECHIDÆ.

Lecithocera luticornella, Zeller.—One, very fine, May 16th, on the hill S.E. of Silves, amongst dwarf-oak in the evening; several were seen.

Depressaria —?—A single specimen, May 14th, between São Bartholomeu do Messines and Silves; it is not fine enough to determine.

Gelechia vilella, Zeller.—One, May 11th, by the stream at Almodovar.

G. spurcella, H.-S.—One, rather wasted, June 12th, at Ponte de Morcellos.

G. malvella, Hüb.—One, somewhat worn, May 16th, on the hill S.E. of Silves.

G. —?—A single specimen, rather worn, May 21st, at an elevation of 2150 feet, at a waterfall at the foot of the last slope of Foia, near Monchique. It seems rather allied to *G. viduella*, but I should not like to describe a new species from a single specimen, which is not in first-rate condition.

Teleia tamariciella, Zell.—One, May 17th, by the streamlet to the west of Silves.

Ptocheuusa inopella, Zell.—One, May 14th, between São Bartholomeu do Messines and Silves.

Parasia castiliella, Mäeschler.—One, May 14th, between São Bartholomeu do Messines and Silves, by the road-side in cultivated lands. The specimen is rather greasy, but seems to agree perfectly with Mäeschler's description, and it does not accord with any other *Parasia* that I know.

Anacamptis vorticella, Scop.—Five specimens, June 23rd, on the slope above the Corgo, near Villa Real.

Cleodora lineatella, Zell.—One, May 16th, on the hill S.E. of Silves.

Nothris limbipunctella, Staudinger?—A very worn specimen is probably referable to this species. It was taken May 10th by the stream near Aldea do Neuves.

Pleurota bicostella, Clerck.—One, June 30th, on the hills above Salamonde.

P. ericella, Dup.—Three specimens, May 6th, at Almodovar; May 10th, near Aldea do Neuves; and May 17th, on the hill south of Silves, in dry waste places.

Harpella Staintoniella, Zell.?, aberr. or n. sp.?—One, in very fine condition, May 20th, in a chestnut wood on the slopes of Picota, at an elevation of 1600 to 1700 feet. This is about the most interesting specimen in the whole batch of Portuguese *Tineina*. The costal spot, instead of being triangular and broadest on the costa, is slender and oblique, its two sides being nearly parallel; the dorsal spot is also smaller than in *Staintoniella* and *Geoffrella*; the connecting silver streak between the two spots, and the absence of the apical black streaks, show this insect to be more nearly related to *Staintoniella* than to *Geoffrella*. It would be hazardous to describe a new species in this genus from a single

specimen: should it eventually prove to be only an extraordinary form of *Harpella Staintoniella*, its occurrence so far west as Portugal is of considerable interest. Hungary, and the neighbourhood of Vienna, are the best known localities for *Staintoniella*; I know of no authority for its occurrence in Piedmont, and am disposed to refer the "Ped." in Staudinger and Wocke's Catalogue, p. 306, assigned to the distribution of this species, to *H. Geoffrella*, which we know is so very abundant in Italy. Herr Mann records its occurrence (Stett. ent. Zeit., 1850, p. 145) by *thousands* in Tuscany, and remarks, that "it was the most abundant moth of any."

ECOPHORIDÆ.

Ecophora detrimentella, Staudinger; noticed also by Dr. Rössler (Stett. ent. Zeit., 1877, p. 379), whose description supplements some characters which Staudinger had omitted to mention.—One, May 21st, near Monchique, on the slopes of Foia.

Egoconia quadripuncta, Haw.—Three, June 13th, at Ponte de Morcellos.

Butalis productella, Zell.?.—One, rather worn, is probably referable to this species. It was captured, June 6th, at C'ea.

B. chenopodiella, Hüb.—One, April 23rd, along the stream between Lisbon and Benifica.

B. acanthella, Godart.—One, worn, May 7th, at Aldea do Neves, and one, very fine, June 11th, by the streamlet near Cea.

Pancalia Latreillella, Curtis.—One, June 22nd, on a mountain to the N.W. of Villa Real, at an elevation of 2480 feet.

GLYPHIPTERYGIDÆ.

Glyphipteryx fuscoviridella, Haw.—Two specimens; one, April 27th, near Cintra, on the hill outside the Parque de Peña; the other, June 6th, at Cea, at an elevation of 1700 feet.

G. schœnicolella, Stainton.—One, very fine, May 11th, by the stream at Almodovar.

G. Fischeriella, Zeller.—Three; one, April 30th, at Parque da Peña, near Cintra; one, May 17th, on the hill to the south of Silves; and one, June 23rd, near Villa Real, on the slope above the Corgo.

COLEOPHORIDÆ.

Coleophora cœspititiella, Zeller.—One, May 19th, by the stream to the south of Monchique, at an elevation of 1500 feet. Two other specimens referable to the genus *Coleophora*, I have not been able to determine to my satisfaction; they were both captured April 30th by the main stream below Cintra

ELACHISTIDÆ.

Laverna miscella, Hüb.—Two, June 6th, at Cea.

There is a single specimen of the genus *Elachista*, but it is too worn to be determined.

LITHOCOLLETIDÆ.

Lithocolletis caudiferella, Ragonot (Ann. Ent. Soc. France, 1876, p. 415).—Two specimens among cork-oaks; one, May 10th, by the stream near Aldea do Neuves; the other, May 12th, by the streamlet near São Barnabe.

L. messaniella, Zell.—One, April 29th, by the main stream below Cintra, amongst bushes.

L. adenocarpi, Staudinger.—One, May 19th, amongst bushes by the stream to the south of Monchique, at an elevation of 1500 feet.

LYONETIDÆ.

Opostega crepusculella, Zell.—One, rather worn, May 19th, by the stream to the south of Monchique, at an elevation of 1200 feet.

NEPTICULIDÆ.

Nepticula suberis, Stainton (*Tineina* of Southern Europe, p. 229).—Two specimens, in fairly fine condition, May 10th, on the trunks of cork-oaks by the stream near Aldea do Neuves.

Mountsfield, Lewisham :
March, 1881.

FURTHER NOTES ON THE EARLY STAGES OF *HYDROCAMPA*
NYMPHÆALIS.

BY WILLIAM BUCKLER.

I have once more to express my gratitude to Mr. W. R. Jeffrey, of Ashford, for persevering aid in carrying on my observations on this species, by means of which I am in a position to offer several particulars as additions to my former paper in the February No. of Ent. Mo. Mag. for 1876 (vol. xii, p. 210). That paper contained descriptions of the larva, and of its case when made from *Potamogeton*, and was supplemented on points to which, at that time, my own observations had not extended, by extracts from Réaumur; and in the correspondence to which it gave rise between us, my friend Mr. R. McLachlan, expressed a belief that further investigation would prove the larva to be polyphagous, and not confined to *Potamogeton* only. I have the pleasure of commencing my present notes by furnishing a full confirmation of this belief; I shall then relate in detail the movements of larvæ, which I watched very carefully and minutely while they were engaged in case-making. I have to give an account of a moult which

I witnessed, and I think I shall show that Réaumur's statement (which always seemed dubious) as to the protection of the eggs by the parent moth must have originated in some mistake.

If my paper seems long, it must be that I have not power to communicate to the reader the intense interest I myself felt whilst watching the proceedings which I have now attempted to record.

About the middle of June, 1876, Mr. Jeffrey sent me larvæ in cases made from *Myosotis cæspitosa* and *Potamogeton natans*; later in the month several from *Hydrocharis morsus-ranæ* and *Sparganium simplex*, this latter plant abounding with cases in one locality; in August came cases from *Catabrosa aquatica*, and in September small larvæ of the next generation in cases from *Potamogeton polygonifolius* and *P. pusillus*. Meanwhile I had been searching in my own neighbourhood, and found a pond with plenty of *Potamogeton natans* in it, and on examining the plants round its margin, detected cases cut from most of those mentioned above, and some also from *Alisma plantago*. It soon appeared, also, that the larvæ sent to me on *Hydrocharis*, a plant not to be obtained here, made no difficulty in taking to any of the others, as well as to *Nymphæa alba*; and, in fine, that whatever might be the food on which the larvæ were found, they were quite as well pleased with that which was most convenient for me to give them; showing themselves, as far as aquatic plants go, thoroughly *polyphagous*.

I now give the details of a case-making, which I watched throughout. The naked larva crawled to near the tip of a leaf of *Potamogeton natans*, fixed its anal legs near the side, and began to eat a little curved channel from the edge through the leaf, working from right to left, its head and body bending round to the left more and more until three-fourths of the intended cut had been accomplished; then, still keeping the same foothold, it ate back again from left to right, clearing out and widening the channel: next it changed its foothold across the channel to the fixed part of the leaf, whence, stretching out its head, it continued eating from right to left, and so carried on the curve of the channel quite up to the edge of the leaf again, leaving only a very narrow isthmus uncut; then, as before, it ate backwards to widen the last cut part of the channel; finally crossing over the channel again, and taking its position on the now almost detached piece, it ate away the last connecting morsel at the very edge, and was adrift as upon a raft: I noticed, however, that a change of plan took place between the first and second parts of its work; the cut made from the first foothold on the side of the leaf had a long oval curve; when, however, crossing the channel, the larva continued its work from its foothold on

the leaf, it did not go on from the very end of the cut already made, but began again at a point a little distance further back, thus finally bringing out the channel with a shorter rounder curve, which had the effect of making the detached piece of leaf more symmetrical in outline. It was now afloat, with its ventral and anal legs clinging to its raft, but very soon it applied its thoracic legs to the fixed part of the leaf, and, guiding its course by them, conveyed itself and its raft under the leaf, apparently looking for a suitable place, whence to cut the other half of its case; presently it seemed to find what was wanted, the floating piece was made fast, and after some hours the upper half was cut out and detached, and the larva floated in its finished dwelling. Continuing to watch it, the next thing I noticed was a rapid horizontal motion of the head and front part of the body of the larva, just within the case from one side to the other; then turning about, after a pause, the larva repeated this movement at the other end, rested awhile, and again repeated the movement: next it turned round again and protruded its head from the former end of the case, with the air of taking a survey of the outside, and whilst it was in this position a small silvery air-bubble floated out from inside the case, and when the larva, turning round once more, put out its head from the other end as if surveying that also, the bubble seemed somehow to be attracted and moved over and settled close to its head: after this, the larva set about feeding, and journeying for about an inch, reached the stem of the plant and fed on it for some time, and then moored its case to the stem by a thread and rested: afterwards I saw it eating patches of leaf-cuticle, soon effecting a large hole through the entire substance; next day I saw it again eating, and noticed that from time to time it stopped this occupation, withdrew its head into its case, and made from five to thirteen of these rapid movements from side to side; vigorous and rapid as these movements were, they did not shake the case, and I think were quite independent of it; indeed, I am disposed to regard them as in some way connected with the act of respiration, being analogous to the movements of the larva of *Paraponyx stratiotalis*, described by me at p. 161, vol. xii, of this Magazine. Bearing on this point also will come some observations I made on the presence of *water within the case*; once or twice it happened that a larva had brought its case into such a position that a good portion of it was above the surface of the water, and I was able to look down the opening at the end into the interior, quite through to the other end, and I made sure that it was full of water, and once I could notice a small silvery air-bubble clinging to the side of the case: probably, when the larva fastens up

its case for pupating, it joins the two pieces so closely together, as to render it watertight, but before that time the openings at the ends are generally so wide that the water cannot be kept out. I am, however, disposed to agree with Réaumur's statement that the larva can control the admission of water to its case, and probably this is regulated by its requirements in the matter of respiration, and must be managed by enlarging or contracting the orifice at either end.

When a larva makes use of *Myosotis*, after selecting the end of a leaf, and detaching a piece of proper length by a semicircular cut, it floats off upon it towards the end of another leaf; there it either mounts on the upper surface, and turns over the piece it is carrying so as to form its new roof, or else carries it underneath and fastens it there as its new floor; either way, after fastening the edges of the detached piece in place, the larva seems to be at leisure in cutting out what is needed from the leaf to complete its case, eating away the surroundings, and not merely making a cut; the cavity between the roof and the floor seems formed by having one of them broader in the first instance than the other, so that when the edges are joined, there is necessarily a bulging out of the broader piece.

When *Sparganium* is the material, the case is of a narrower and more elongated form, the floor being the flatter side, and thus shorter than the roof, which is arranged so that the keeled surface of the leaf is outside, and the thin side-edges drawn inwards, and thus made to help in the formation of the cavity. Not unfrequently the case is formed of two sorts of leaf, for a larva is not particular to have its case all of the same material; apparently in its growth between two moults it changes only one-half of its case at a time, whereas after a moult it sometimes makes a new case entirely; when, therefore, it wants only a new roof or a new floor, it takes it from a suitable plant nearest at hand, cutting the new piece a little larger than its predecessor, and in this way, by changing the top and bottom alternately, it soon brings a small case up to a good size.

On June 11th, I noticed a larva looking as if about to moult, and isolated it for observation: the moult took place on 13th; after the skin burst at the neck, the old head-cover first fell off, and then the (almost colourless) larva began slowly to advance into the water out of its case until nearly exposed, then it stopped still for about ten minutes, when suddenly the hinder segments were set free with an effort that sent the case adrift, while the larva remained quite naked in the water: I secured the abandoned case, and opening it found the cast flaccid skin—not shrivelled up—but held out at full length by silk threads along the ventral region.

This larva now proceeded to make itself a case of *Alisma plantago*, first securing a piece of leaf that was near, and then fastening this under another leaf that floated by ; three hours after it thus hid itself I turned the leaf over, and found the piece by this time fashioned into a suitable oval shape, and attached to the oval edge of the leaf, so that on that side there was no need of cutting : next day the larva was shaping the second piece—not merely by cutting a channel, but by eating away a large irregular hole outside its case, still, however, leaving a narrow isthmus uncut, so as to keep itself securely moored for a day or two longer ; but at last when it had to stretch out further and further to continue feeding on the leaf it made its case tight, cut the mooring, and floated off. When the larva is about to pupate it attaches its case at the edge of one side beneath some floating leaf or submerged stem, often (as Mr. Jeffrey found a great number) to the decumbent stems and tough fibrous roots of the *Myosotis* bared by the action of water, but always fixed edgewise ; indeed, the only exception was in a case fixed flat against a piece of *Sparganium*.

After the larva had spun up, from seventeen to twenty days elapsed before the appearance of the imago ; I bred seventeen specimens in all at intervals from June 21st to August 26th.

Fortunately for our knowledge of the interesting early part of the economy of *nymphæalis*, Mr. Jeffrey detected amongst some *Potamogeton natans*, gathered promiscuously as food for his larvæ, a large leaf, having eggs deposited on the under-surface, *but without the least covering* ; and cutting off the extreme tip of the leaf on which were six eggs, for himself, most kindly sent me, on 8th of August, the rest of the leaf bearing about a hundred eggs of a pale ochreous-greenish colour, close together in a flattish mass near the margin from which the tip had been severed ; three days later, by aid of a lens, I could see two black specks on each egg, and in two more days these were distinct enough, and the day after that, August 14th, the larvæ all hatched, and *soon hid themselves by mining into the under-side of the leaf*, not, however, before I had observed and noted their black heads and collar plates with pale greenish-yellow translucent bodies. On the same day Mr. Jeffrey was watching the six eggs he had retained, having placed the severed bit of leaf on the upper surface of a fresh gathered leaf put in water ; and at about 8 a.m., saw the little creatures leave the egg-shells, and crawl over the upper surface of the fresh leaf, and from thence to the under surface, which they at once entered by mining on either side of the midrib near the base. In this manner my young brood remained ensconced from thirty hours to three days,

and began to re-appear at first singly, then several together, and then each cut out for itself a tiny film from the under cuticle of the leaf, and floated away on it just as I have described above, and by the 18th of the month the water was crowded with tiny cases not one-eighth of an inch long. After moulting the black colour of the head of the larva became brownish ochreous, the collar-plate still black, the body dirty whitish with broad greenish dorsal vessel, and by help of a strong lens I could see the fine opaque whitish tracheal thread; the larvæ continued to thrive and were frequently making fresh cases, half at a time, until the period arrived for hibernation, when the cases were spun up flat against the leaves, and, content with what I learnt, I sent them adrift to take their chance in a state of freedom.

Emsworth: *March 3rd*, 1881.

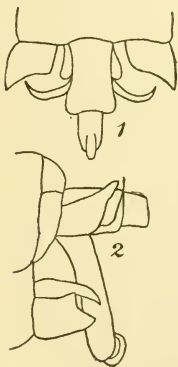
DESCRIPTION OF A NEW SPECIES OF *TRICHOPTERA* (*POLYCENTROPUS KINGI*) FROM SCOTLAND.

BY R. McLACHLAN, F.R.S., &c.

POLYCENTROPUS KINGI, *n. sp.*

In size and general appearance much resembling *P. flavo-maculatus* and *multiguttatus*, especially the latter. The dark portions of the anterior-wings more pronounced, and nearly black, more decided in the spots and spaces on the costal margin: apical fork No. 3 sessile, or with a more or less long footstalk.

In the ♂ the dorsal plate is oblong, with nearly parallel sides. Superior appendages testaceous, with pale hairs, rather short, the apical margin scarcely excised. Intermediate appendages testaceous, divergent, flattened, considerably dilated at the base, but gradually attenuate to the acute apex, inserted near the base of the dorsal plate beneath. Inferior appendages moderately large, sub-oblong, convex externally, the apical margin oblique and somewhat excised; sub-testaceous, with pale hairs, but the margins are fuscous or blackish. Inserted above each of these latter appendages, and lying partially in their concave upper (or inner) portion, is a *yellow flattened supplementary appendage*, fringed with very long pale hairs; viewed laterally, they appear almost linear, because in that position only the edge is seen. Penis *very long and stout*, yellow, directed downward between the inferior appendages, sub-cylindrical, obtuse; at its apex is an appearance as of a short recurved process, which is only occasionally visible. The ♀ presents no decided differential characters in the dry insect.



Expanse, ♂, $14\frac{1}{2}$ — $16\frac{1}{2}$ mm., ♀, 17—18 mm.

Strathglass, Inverness-shire, August, *J. J. King*, about twenty examples.

Like most other species of the genus, this is practically separable

only by the anal parts of the ♂, which are distinct from those of the other described forms. The supplementary inferior appendages, and the very long and strong penis, are especially remarkable, in which points of structure there is some analogy with the genus *Plectrocnemia*, but the insect is a true *Polycentropus* in the restricted sense. See my "Revision and Synopsis," p. 397.

Desiccation alters the forms of the anal parts very considerably, and it is only occasionally that the structure can be clearly demonstrated in dry examples.

Fig. 1 represents the anal parts of the ♂, from above; fig. 2, the same, from side.

Mr. King's captures induced me to make an examination of a series of specimens of *Polycentropus*, taken by Mr. Eaton in Portugal, in 1880. I found that these consist, probably, entirely of undescribed forms, and amongst them are four examples that, in all probability, are specifically identical with *P. Kingi*. One of these, from Alferce, 22nd May, appears to agree in all respects; three others from Monchique, 19th May, Cea, 11th June, and Villa Real, 23rd June, respectively, are much larger (Expanse, ♂, 18—20 mm.), and more strongly marked, but the structure appears to agree. Scotland and Portugal are widely-separated localities, but, considering the great similarity of the species, and the neglect from which they suffer, there is all possibility that this particular species occurs in the intervening districts.

Lewisham, London: 5th March, 1881.

A NEW SPECIES OF *HELOTIDÆ* FROM JAPAN.

BY GEORGE LEWIS.

In the Trans. Ent. Soc., 1874, p. 447, my friend, the Rev. H. S. Gorham, has described a species of *Helota* from this country, and last summer I found a second, a small mountain species, quite distinct from any of the three or four now in the catalogues. I propose to call it—

HELOTA CEREOPUNCTATA.

Coppery-bronze, shining, head and thorax closely and somewhat coarsely punctured, the latter having a smoother irregular portion before the scutellum, extending half-way up from the base. The thorax is parallel, hinder angles acute, with the centre portion of the base less sharp than in *gemmata*. The elytra are evenly and regularly punctate-striate, the striæ, ten in number, with interstices very slightly convex. The usual wax-like spot before the middle of the elytra is round, and occupies the interstices of the 4th, 5th, and 6th striæ from the suture, the punctures of the 5th being visible down its centre. The second spot is situated before the apex, where the 4th and 5th striæ terminate and join, and it is more oblong than the 1st. Antennæ pitchy-bronze. All the thighs are red for the basal half of their length; and the abdomen is pitchy-red.

Length, 4 lines.

The chief points of difference between this species and *gemmata** are, its smaller size, the entire absence of the raised polished surfaces on the thorax, the evenness and the uniformity of the striæ, and the comparatively larger size of the wax-like spots. The appearance of the first or basal spot in *gemmata*, which rests in the interstice of the fourth and fifth elytral striæ, is as though the spot had pushed aside the punctures which had then opened and formed a "setting" to it. In the present species, the spot covers two interstices; and the 5th stria, running through it, is distinctly visible. The sexual characters of both insects are alike. When *H. cereo-punctata* is alive, it is exceedingly like a *Buprestis*, and this similitude is enhanced by a portion of the red colour of the thighs protuding over the edges of the body, giving the insect the appearance, when viewed from above, of having six red spots on its margin. I have a black species of *Melandrya* with legs (yellow) coloured in the same manner, and as it walks over dead branches it looks like a spotted *Chalcophora*.

I obtained the *Helota* in June, off dead branches of young oaks, which had been killed early in the spring by a forest-fire.

Grand Hotel, Yokohama:

13th January, 1881.

Asopia Lienigialis, Zell., a moth new to Britain.—I captured a *Pyralis* at light in August, 1879, which I put aside as a variety of *P. farinalis*, but in the last August and September I took three others, all at light. I then saw that it was something new and sent a specimen to Mr. C. G. Barrett, who informed me that it was *Asopia Lienigialis*, Zell., a species as yet only recorded as occurring in Livonia and Finland. Another collector here (Mr. Bryan) has also taken three or four specimens.—W. THOMPSON, 183, Stantonbury, Stoney Stratford, Bucks: February 26th, 1881.

[A type of *Asopia Lienigialis* from Professor Zeller differs from *farinalis* in the position of the first whitish line, which is nearer the middle of the wing, the basal blotch being therefore larger and the median area smaller than in that species. The second pale line is more regularly curved and originates in a broader pale streak or blotch on the costal margin. In the hind-wings the first delicate pale striga, which in *farinalis* forms a continuation of the first line on the fore-wings, is, in *Lienigialis*, placed more perpendicularly so that it originates opposite the middle of the basal blotch of the fore-wings. Zeller's specimen closely resembles *farinalis* in colour, but Mr. Thompson's specimens are more fuscous—approaching the colour of *Pyralis glaucinalis*—the markings, however, agree accurately.—C. G. B.]

[The occurrence with us of this Northern species, so closely allied to our old friend *P. farinalis*, is of extreme interest. Baron v. Nolcken in his Fauna of Esthonia, Livonia, and Courland, mentions that he had only met with a single

* I found this species commonly in Yezo last summer—on willows, where the larvæ of *Hepialus* were at work—so it probably occurs throughout Dai Nippon.—G. L.

specimen. And von Heinemann, in his "Schmetterlinge Deutschlands und der Schweiz," mentions the species not as having occurred, but as *likely to occur* in the North-eastern districts of Germany. Professor Zeller was, at one time, much exercised in his spirit as to whether this might not prove to be the veritable *farinalis* of Linné, but I believe he settled down ultimately in the old established faith, and our nomenclature of the two species has thus not been rudely disturbed.—H. T. S.]

Notes on Lepidoptera taken in Roxburghshire in 1880.—I have made a few notes of some species of moths which I have taken during last season in this district of Roxburghshire, and which may be of some interest, as a few of them, I think, are not generally understood to occur so far north. Any of the species noted of which I had any doubt as to identity, have been confirmed by Mr. C. G. Barrett, and so may be relied upon.

Of the *Sphingidæ*, I obtained one specimen only of *Acherontia Atropos*, found at rest in June. Of *Sesiidæ*, I took two fine specimens of *Sesia bembeciformis*, which emerged from some old willow bushes, which had been cut in March and laid up for firewood, the moths emerging in the beginning of July. Of the *Hepialidæ*, *H. sylvinus* and *velleda* are both very common; the former swarms on a steep hill-side with patches of bracken and open places, in July, and higher up the hill, where the ground in places is a little marshy, *velleda* may be seen starting about at dusk very commonly. Of *Chelonidæ*, I found *C. plantaginis* at one particular locality very plentiful; the moths were flying over patches of bare heather and marshy ground or moorland, near to an extensive wood of Scotch and spruce fir. When I first discovered them I took over a dozen specimens, all of them ♂, and I did not succeed in taking a ♀ specimen; the moths seemed to fly best about 4 p.m. I found two cocoons of *Arctia fuliginosa* spun up on heath in May, and both produced fine specimens in June. Of *Geometræ*, I took several ♂ specimens of *Hybernina aurantiaria* in autumn. *Cheimatobia boreata* is common, and I have usually found it settled on hawthorn twigs, more commonly when bordering plantations of firs. *Oporabia filigrammaria* was also very common last autumn, and showing considerable variety in the specimens, both as to size and shades of colouring; I saw them frequently on the sugared trees, and flying at dusk, and often started them during the daytime when passing among the trees in small plantations, principally of Scotch fir. I got one specimen of *autumnaria* at dusk, when sugaring trees on a rather high moorland locality; it differs from *filigrammaria* by all the wings being more elongate in form, and there is a distinct discoidal spot on hind-wings, it also occurred about a month earlier. I found *Larentia salicata* moderately common, sitting on trunks of Scotch fir in an extensive plantation of old trees; here, also, *casitata* was very abundant, and *Cidaria populata* pretty common. I took a few specimens of *Eupithecia indigata* mostly along the borders of fir woods, and *pygmaea* flying during the day. *Melanippe tristata* is common in one locality in what may be termed hilly heath-ground; I found it in the glades of a rather extensive fir plantation running along a moorland ridge, flying among the flowers in the sunshine and again at dusk. *Anticlea derivata* occurs sparingly; I took one specimen at rest on an elm trunk, and two more near a hedge of beech at dusk. *Cidaria psittacata* and *miata* are both tolerably common in autumn, and the latter after hibernation; *suffumata* occurs plentifully in the fir woods, but the *var. piceata* is scarce. *Chesias*

spartiata is common about broom in September. *Tanagra chærophyllata* is rather scarce, but occurs very plentifully on the grassy hills about fifteen miles to westward. Of *Noctua*, I took in September two fine specimens of *Calamia lutosa* at sugar. *Celæna Haworthi* is rather common on the high moorland ground, and obtained best by sugaring the scattered trees of Scotch fir growing there. *Noctua glareosa* is sufficiently common for one to obtain a good series without difficulty. *Orthosia lota* and *macilenta* are not scarce, and I took a number of each in fine condition; also two specimens of *Hecatera serena*. *Poli chi* is very common, and the variety *olivacea* frequently occurs, some of a pale green, varying to a dark smoky shade, the abdomen being almost black. I took about a dozen specimens of *Aplecta occulta* at sugar, a few of them on the Scotch firs in the moorland locality, where *Celæna Haworthi* occurs. At the same place, *Hadena adusta* swarms at sugar in June; and in a leaf-wood bank near to this, and also on hedgerow trees, *thalassina* and *contigua* are pretty common. Of the *Calocampæ*, I took ten fine specimens of *exoleta* and three of *vetusta*: one of the former on the high moorland ground. *Habrostola urtica* was common at raspberry bushes in June, I think, of 1879, but much scarcer last season. *Plusia pulchrina* and *iota* are both moderately common, the former mostly at honeysuckle, and *iota* at bloom of rhododendron. Of the species which seem scarce, and of which I have taken of each only a single specimen, I may mention the following: *Acronycta ligustri*, *Noctua conflua*, *Orthosia suspecta*, *Tethea subtusa*, and *Epunda viminalis*.—A. ELLIOT, Samieston, Jedburgh, N.B.: February, 1881.

Early appearance of Pieris rapæ.—This afternoon, at Merton, Surrey, I was surprised to see one of the small white butterflies, *P. rapæ*, flying about in the bright sunshine, apparently enjoying it. I have never before met with this species so early in the season, and it struck me as so unusual that I stayed for some minutes watching it.—JOHN W. DOWNING, 59, Lupus Street, S.W.: March 15th, 1881.

Ichneumonidæ new to Britain.—A few Ichneumons taken here by me were forwarded to Mr. Fitch, by Mr. E. A. Butler, who has kindly examined them and informs me that there are among them two species new to Britain: *Agrothereutes batavus*, Voll., Tijds. v. Ent., xvi, p. 209, pl. ix, fig. 1, ♀, among the *Cryptides*, and *Lissonota leucozona*, Grav., Ichn. Eur., iii, p. 100, ♀, one of the *Pimplides*. These were taken in the same sand-pit in which I found *Bothynotus pilosus* and about the same time, in September. I also found *Aptesis stenoptera*, Marshall, Ent. Mo. Mag., v, p. 156.—E. N. BLOOMFIELD, Guestling Rectory: March 4th, 1881.

Dr. Adler's second memoir on dimorphism in the Cynipidæ which produce Oak-Galls.—In Vol. xiv, p. 44, of this Magazine, attention was briefly directed to a remarkable assertion by Dr. Adler, of Schleswig, to the effect that certain of our oak-galls, and their producers, are only dimorphic conditions, the galls in one brood being totally different in form from those of the other, and the flies so different as to have been placed in distinct genera: Dr. Adler's statement and the proofs, were fully detailed in the "Deutsche entomologische Zeitschrift," 1877, pp. 209—248. At that time his statements were received with a considerable amount of incredulity: but subsequently some, at least, of his observations were proved to have been correct, by Messrs. J. E. Fletcher, Lichtenstein, and Cameron (cf. Ent. Mo. Mag., xiv, p.

265; xv, p. 12). Dr. Adler has just published a very extended memoir on the same subject in the "Zeitschrift für wissenschaftliche Zoologie," Bd. 53, pp. 151—246 (February, 1881), in which he gives the results of his experiences concerning a very large number of oak-gall *Cynipidæ*, and illustrates his memoir by two very excellent folded chromo-lithographic plates with figures of the galls, in which the latter are delineated with a truth to nature rarely equalled. It is not pretended in this short notice to fully detail the results obtained by Dr. Adler, and the *modus operandi*.

The results amount briefly to these:—

PARTHENOGENETIC BROOD.

SEXUAL BROOD.

<i>Neuroterus lenticularis</i>	is changed to	<i>Spathegaster baccarum</i> .
„ <i>læviusculus</i>	„	„ <i>albipes</i> .
„ <i>numismatis</i>	„	„ <i>vesicatrix</i> .
„ <i>fumipennis</i>	„	„ <i>tricolor</i> .
<i>Aphilotrix radialis</i>	„	<i>Andricus noduli</i> .
„ <i>Sieboldi</i>	„	„ <i>testaceipes</i> .
„ <i>corticis</i>	„	„ <i>gemmatus</i> .
„ <i>globuli</i>	„	„ <i>inflator</i> .
„ <i>collaris</i>	„	„ <i>curvator</i> .
„ <i>fecundatrix</i>	„	„ <i>pilosus</i> .
„ <i>callidoma</i>	„	„ <i>cirratus</i> .
„ <i>Malpighii</i>	„	„ <i>nudus</i> .
„ <i>autumnalis</i>	„	„ <i>ramuli</i> .
<i>Dryophanta scutellaris</i>	„	<i>Spathegaster Taschenbergi</i> .
„ <i>longiventris</i>	„	„ <i>similis</i> .
„ <i>divisa</i>	„	„ <i>verrucosus</i> .
<i>Biorhiza aptera</i>	„	<i>Teras terminalis</i> .
„ <i>renum</i>	„	<i>Trigonaspis crustalis</i> .
<i>Neuroterus ostreus</i>	„	<i>Spathegaster aprilius</i> ?

In the following only one brood, and that parthenogenetic, and not dimorphic, was obtained, viz.: *Aphilotrix semilunatus*, *A. marginalis*, *A. quadrilineatus*, and *A. albopunctatus*.

There are sufficient materials in the list above given to excite the astonishment of entomologists, and to induce them to follow up the author's observations, not only on the species named, but also on other gall-flies.

Perhaps one of the most remarkable couplings is that of *Biorhiza aptera* (the root-gall of the oak) and *Teras terminalis* (the common oak-apple); the insect of the former is always apterous, and must occasionally climb 50 or 60 feet in order to deposit its eggs in the twigs on which the "oak-apples" are produced.

The forms are divided into the *Neuroterus*-group, the *Aphilotrix*-group, the *Dryophanta*-group, and the *Biorhiza*-group.

The memoir concludes with an examination of the anatomical structure of the ovipositor in *Cynipidæ* and of the manner in which the eggs are laid.

All Entomologists interested in this question should study this memoir: the plates will enable them to identify most (if not all) of the British oak-galls, and will perhaps lead to the discovery of others.—R. McLACHLAN, Lewisham: 14th March, 1881.

Sehirus 2-guttatus and other Hemiptera near Hastings.—On Saturday last, my brother and self took from moss, growing in a good-sized wood at Guestling, a nice series of the above. Believing it to be uncommon, I thought it was worth while

recording. I took at Fairlight last July, a developed specimen of *Pithanus Märkeli*, and a developed specimen of *Acalypta parvula*, at Rye Harbour.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: *March 15th*, 1881.

Acalypta cervina near Hastings.—A few weeks ago, I found a specimen of this bug in moss in Hollington Wood. There were a number of larvæ with it, which, from their appearance I should judge to be of the same species.—E. A. BUTLER, Hastings: *March 16th*, 1881.

Hibernating Hemiptera in Perthshire.—The winter here has been very severe, snow has been continuously on the ground for 11 weeks, and the temperature was on several occasions below zero, Fahr.; lately, however, I have brought in daily, leaf and moss *débris*, but found nothing in the way of bugs except one specimen of *Gnathodus punctatus*, a curious time to find it.—G. NORMAN, Athole House, Pitlochry: *March 3rd*, 1881.

Sericomyia borealis near Hastings.—I was much surprised to see here the last two seasons the very beautiful fly *Sericomyia borealis*, Fall. It has appeared very sparingly at Guestling, but when at Dallington Forest, September 1st, 1880, we saw it not uncommonly. I thought it an exclusively northern species. It has not, I think, been previously noticed as occurring in Sussex by any of our naturalists, such as Mr. Verrall, Mr. W. C. Unwin, and Mr. J. H. A. Jenner, all of whom have paid some attention to our *Diptera*.—E. N. BLOOMFIELD, Guestling Rectory: *March 4th*, 1881.

Sapromyza bipunctata, a Dipteron new to Britain.—Among some flies sent to Mr. Verrall in 1879, one species, *Sapromyza bipunctata*, Meigen, seems to be new to Britain. I do not know at what time of the year I took it.—ID.

Lathridius filum, Aubé, at Burton-on Trent.—Mr. Mason brought me over to Repton, at the beginning of last month, some beetles which he had found in his Herbarium, which, on examination, I found to be *Lathridius filum*, of Aubé. Mr. Mason compared them with some specimens in Mr. Rye's cabinet, with which they perfectly agreed. This insect was taken in Edinburgh, by Mr. McNab, of the Royal Botanic Gardens, and recorded in this Magazine, vol. iii, p. 46.—WILLIAM GARNEYS, Repton: *March 17th*, 1881.

ENTOMOLOGICAL SOCIETY OF LONDON: *2nd February*, 1881.—H. T. STAINTON, Esq., F.R.S., President, in the Chair.

The President appointed Sir J. Lubbock, Bart., and Messrs. Meldola and Distant, Vice-Presidents for the year.

The following were elected Members, viz.:—Alfred Lloyd, Esq., of The Dome House, Upper Bognor, and Theodore Wood, Esq., of 5, Selwyn Terrace, Upper Norwood.

Mr. Salvin exhibited a large collection of insects of all Orders from Guatemala, recently received from Mr. Champion.

Mr. W. A. Forbes exhibited (on behalf of Dr. Sclater), a singular species of *Coccidæ* from New Britain, covered with long white filaments. Also a large larva of one of the *Blattidæ*, found by himself at Pernambuco, having a deceptive resemblance to an Isopod Crustacean.

Mr. McLachlan exhibited large Coleopterous larvæ from South America, apparently belonging to the *Dynastidæ*, whence proceeded remarkably fine examples of the fructification of a *Cordyceps*. He remarked that it was no doubt the same species as that described and figured by G. R. Gray in a privately-printed work on insects attacked by fungi, issued in 1858, in which several similar instances are noticed. He also exhibited a *Noctua* from South Wales, sent by Mr. Barrett, attacked by a fungus of the genus *Isaria* (since identified by Dr. M. C. Cooke with *I. sphingum*, Sch.).

Mr. Pascoe exhibited an example of *Peripatus novæ-zelandiæ*, remarking on the difference of opinion that has existed, and still exists, with regard to the affinities of these singular animals, which were originally classed with the Vermes, afterwards apparently proved to be Arthropods, but now again transferred to their former position by some authors.

Mr. Billups exhibited *Pezomachus distinctus* from Mickleham, a species new to Britain, and a *Stibeutes* from Deal, also new to this country.

Mr. Distant exhibited a very fine new species of *Cicadidæ* of the genus *Platycleura*, from Madagascar.

Mr. Meldola read a letter from M. André, replying to certain criticisms at a recent meeting (*vide antea*, p. 167) as to the practice of printing short descriptions of new species on the cover of a work, for the sake of securing priority.

Mr. Fitch read an extract from an Australian newspaper regarding the death of a child from the supposed bite of a small spider.

Mr. Butler communicated "Descriptions of new genera and species of Heterocerous *Lepidoptera* from Japan."

Mr. McLachlan read "Notes on *Odonata* of the sub-families *Corduliina*, *Calopterygina*, and *Agrionina*, collected by Mr. C. Buckley, in the district of the Rio Bobonaza in Ecuador." One beautiful new species—*Thore concinna*, McLach.—was exhibited.

Mr. Kirby read a "List of the *Hymenoptera* of New Zealand," enumerating 82 species, five of which were new. No *Apidæ* had been discovered.

Mr. Baly read "Descriptions of new species of *Galerucidæ*."

2nd March, 1881—The President in the Chair

H. Bedford Pim, Esq., of Leaside, Upper Norwood, was elected Member of the Society.

Mr. Fitch exhibited an example of *Strangalia 4-fasciata*, taken by Mr. Olliff at West Wickham, in August last.

Mr. W. C. Boyd exhibited a remarkably fine example of *Calamia lutosa*, which he had found at a gas-lamp at the Liverpool Street Terminus of the Great Eastern Railway, to which it had possibly been brought by one of the trains. Also what was supposed to be a curious variety of *Ennomos tiliaria* taken at Cheshunt.

Mr. Kirby shewed parts of a general work on entomology in course of publication by Herr Buchecker, of Munich, in which coloured photographic figures formed prominent features. Mr. McLachlan said that the portion of this work relating to dragon-flies had been very severely criticised, especially as regards the ignorance shown in the text.

Mr. Fitch read a detailed report from the "Western Daily Mercury" on the discovery of living Colorado-beetles in possession of a man near Plymouth, with editorial leaders on the legal proceedings taken against that individual.

Mr. McLachlan called attention to a remarkable memoir by Dr. Adler on dimorphism in oak-gall *Cynipidæ* (see *ante*, p. 258).

Mr. Pascoe read a paper on the Rhyncophorous genus *Hilipus*, of Germar, and its neotropical allies, and exhibited a long series of species in connection therewith.

Mr. Distant read "Descriptions of two genera and species of *Rhynchota* from Madagascar."

Professor Westwood communicated notes on *Scleroderma* and allies.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(Continued from page 84).

Peronea (Teras) Logiana, Schiff., = *tristana*, Hüb.—I met with the larva of this species for the first time in great abundance in Somersetshire, eighteen months ago. Wilkinson's description of its habits is very good. When feeding on the bushes of *Viburnum lantana* in the hedges, the discoloration produced among the leaves was surprising, indeed, those on the lower portions of the bushes down the side of the bank became a tangled mass of drawn-together and dead-leaf membrane, only the under-side of each leaf being eaten away. The larvæ were active, slender, slightly flattened, with deeply divided segments—more so than usual in this genus,—very pale yellowish, with large, distinct, dull green or brown, internal dorsal vessel. Head very pale yellowish, mouth darker, plates and feet almost colourless. Young larvæ remarkably colourless, except the dorsal vessel. On *Viburnum lantana*, eating the under surface and parenchyma of the leaf, and drawing the space between the ribs longitudinally together (much as is done on a smaller scale by the larva of *Lithocolletis lantanella*), living in a small chamber more closely drawn together at one end of this space. Feeding through September, spinning up among the leaves. Pupa brown. The moths emerged in considerable variety in October and November.

These Somerset larvæ differed in colour from those described by Wilkinson, and by Kaltenbach, being yellowish rather than olive-green. The latter author notices the curious habit of the species of scraping off the down ("felt") of the under-side of the leaf (a habit in which it resembles some of the larvæ of the *Pterophoridæ*), he also states that the pupa has two oblique rows of short tufts of bristles on each hinder abdominal segment.

Peronea rufana, Schiff.—The year before last, my friend, Mr. Dunsmore, of Paisley, when on an excursion to the west of Scotland, found larvæ of this species in abundance, and reared the moths. Before the season came round he went to America, but left his friends, Messrs. Watson and Whyte, of Paisley, full information respecting his locality, and to their united kindness I am indebted for the opportunity of rearing and describing this larva. It is so unlike the usual style of *Peronea* larvæ, that I felt certain, until the moths actually emerged, that my kind correspondents had collected another larva (perhaps *Penthina dimidiana*) by mistake; therefore, the emergence of the promised species was an agreeable surprise. The larva is not very active, cylindrical, plump when full grown, smoky-grey of various shades, sometimes blackish, especially on the back, but fading to smoky-green when full-grown; spots raised and distinct, shining, and with short hairs. Head black, or blackish-brown, or occasionally brown, dorsal plate shining jet-black, anal plate yellowish-green, anterior feet black. In July and August, on *Myrica gale*, drawing neatly together the terminal leaves, and eating out the heart of the shoot. Pupa dark brown, spun up among dead leaves and rubbish. The moths emerged through September. One of them is the red variety with the slaty tinge, which so much resembles *lipsiana*, but its fore-wings are more pointed than in that species.

Peronea hastiana, L.—Larva when young, very pale yellow-green, or bluish-green, head and plates black or blackish, or sometimes anal plate green; under the turned-down edge of a leaf of willow. When rather older, the dorsal plate is dark brown, and sometimes the dividing line is visible on it. When half-grown, pale green at the sides, dusky-green on the back, sometimes with a faint whitish efflorescence or downy appearance, head light brown, plates green or anal plate yellow; still under turned-down leaves, or beginning to unite leaves flatly together, and feeding between them. When full-grown, entirely pale green, generally with the whitish efflorescence, which is especially visible between the segments, but the head and dorsal plate often have a brownish tinge. Full-grown larvæ of the first brood, however, have sometimes black head and plates. This brood which is not common, is full-fed by the end of May. The second brood is plentiful enough, feeding between the leaves of the common species of willow at the road sides, from July to September, folding the leaves or drawing together two or more, or joining a leaf to the twig, sometimes disfiguring the bushes, always leaving the feeding place when full-fed to spin up among rubbish on the ground. Pupa dark brown, in a slight cocoon. Moths

emerging through September, October, and November. According to my experience, the larvæ collected in July and early in August the moths from which emerge in September, produce a far larger proportion of singular and beautiful varieties of the perfect insect than those collected later. The moths from the May brood are small, and still less variable. Treitschke says that the larva feeds on *Salix caprea*, *aurita* and *acuminata*, *Andromeda* and *Vaccinium*. It seems probable that the larvæ on the two last-named plants may belong to other species, possibly *maccana*.

Peronea variegana, Schiff.—Larva rather sluggish, cylindrical, but slightly flattened anteriorly, with deeply divided segments. Pale yellowish or pale green, with distinctly pulsating dark green or reddish-brown internal dorsal vessel. Spots not visible, hairs minute, head shining yellowish-brown, plates yellowish or green. On hawthorn, joining two leaves together with very white silk, often joining a dead leaf to a living one. It, however, deserts this habitation to spin up. Feeds through July, and the moth emerges in August or September. It also feeds on blackthorn and other trees. Treitschke says on fruit trees, *Corylus*, *Cotoneaster* and *Carpinus*, Wilkinson rose and bramble.

I am well aware of the extreme difficulty of establishing a new species in such a genus as *Peronea*, but I find that the *species* of the genus are *exceedingly constant* in one respect, that of the *form of their fore-wings*. Therefore, I have for years been puzzled by specimens which did not agree in this respect with any recognised species. My first specimens were taken in a "car" at Ranworth fen, and I placed them provisionally with *logiana*, but, after rearing that species in large numbers, and becoming intimately acquainted with its shape and its phases of variation, I saw that the Ranworth specimens must be removed. They were then placed with *Schalleriana*, but when I found the species in some numbers here in Pembrokeshire, and collected it along with *Schalleriana*, *comparana*, and the varieties of *variegana*, and saw its distinct shape—even more evident in living specimens,—I had no resource but to look upon it as a species distinct from all of them; and, further, that the separation of this form rendered the allied species much more natural and recognisable. I find that my own difficulty has been shared by several friends—close and careful students of this group,—and they cordially agree in my view of the distinctness of the species. Dark specimens sent to Professor Zeller, several years ago, were not known to him.

As I cannot find among the numerous old descriptions of (so-called) species of *Peronea*—since deservedly reduced to the ranks of varieties,—any that can be relied upon as referring to this species, I am compelled to find it a name, and, therefore, adopt one which it has thoroughly *earned*.

Peronea perplexana, sp. n.

Fore-wings long, with costa much arched at the base, apex slightly pointed, and anal angle full and rounded, so as to give the wing a rather truncate form. Glossy, pale chestnut, varying to greyish-brown, and very dark grey-brown, almost black, appearing rather reticulated from being crossed by five irregular lines of slightly raised brown dots, and having in the middle of the second of these lines a distinct raised "button" of brown scales, which is very apparent in the darker varieties. Margin of basal blotch indicated by the usual brown streak from the base of the dorsal margin of the wing. Costal triangular blotch large, red-brown, varying to black-brown, reaching two-thirds across the wing, and nearly to the apex, but often merged into a broad, oblique fascia, which then occupies great part of the posterior half of the wing. The anterior margin of this triangular blotch coincides with the second line of dots and raised button, already mentioned, and is of a rich red-brown in even the darkest specimens. Cilia brown, with a darker interrupted line at the base. Hind-wings faintly tinged with grey, with darker margin, and pale cilia. Head and thorax brown or grey-brown, varying with the fore-wings, abdomen greyish, with a light brown anal tuft.

It differs from *Schalleriana* in the more decided basal arch of the costa, from that species and *comparana* in its longer wings and more truncate hind margin, and from *logiana* in its more pointed apex and longer wings. It is altogether a broader-winged insect, and larger than *comariana*. In colour it resembles some varieties of *comariana* and *comparana*, and in its produced blotch, the variety *latifasciana* of *Schalleriana*, but its triangular blotch is not so flat as in these species, and is never margined with white as in the last-named. Its larva is rather slender, cylindrical, not active. When young, yellowish-white, with a reddish or greenish internal dorsal vessel, head and dorsal plate black; when older, greenish-white with green dorsal vessel, head and dorsal plate pale brown. On hawthorn (*Cratægus oxyacantha*) and blackthorn (*Prunus spinosa*), folding down the edge of a leaf lengthwise, or drawing it together, feeding in the middle of June. Pupa light brown. I think that the larva spins up in its leafy habitation—certainly it does so sometimes. The imago appears about the middle of July, and is almost always found in *hawthorn* bushes, though I have reared it from blackthorn. In this district it frequents warm, sheltered lanes, especially near the sea, but I have seen specimens from Herefordshire, and, I think, from Kent. I do not think that it is a generally distributed or common species.

Peronea aspersana, Hüb.—The larva of this species cannot be looked upon otherwise than as a nuisance—here, at any rate. On the coast it swarms on the sand-hills, feeding impartially upon *Rosa spinosissima* and *Poterium sanguisorba* in the quarries, also on the *Poterium*, and, for purposes of deception, no doubt, on *Potentilla reptans*, the leaflets of which it draws together and gnaws. From the mountains I brought home minute larvæ, on the common *Tormentilla*, and cherished them to full growth, only to be disappointed by the appearance of *aspersana*, and a larva on *Potentilla anserina*, with the curious habit of gnawing into the mid-rib, and causing the upper leaflets to wither, was reared with equal curiosity, and a similar result. It also forms one of the company of species the larva of which delight to feed in the top shoots of *Spiræa ulmaria*, when trying to unfold itself, in the Norfolk marshes. The young larva is slender, cylindrical, active, yellowish or pale yellowish-green, with jet-black head, dorsal plate jet-black or blackish-brown, anal plate grey or yellowish with a dark spot. When older, still slender and active, yellowish-green, or bluish-green with the under-parts yellowish, or dark green, with the head and plates light brown, the latter sometimes black-margined, and, in some of the full-grown larvæ, the plates become shining green. Drawing together the leaflets of the above-mentioned plants and gnawing their surfaces; leaving the shoot when full-grown to spin up among rubbish. Feeding in May and to the middle of June; emerging in July.

Peronea Shepherdana, Steph.—For the larva of this very local species I am indebted to the kindness of my friend, Mr. W. H. B. Fletcher, who sent a good supply from Wicken Fen last June. I am thus enabled to describe the variations of this larva, which varieties I certainly expected would prove to belong to more than one species. The larva is not active, cylindrical, but slightly attenuated at each end. When young, whitish, tinged with grey on the back, and with a yellowish internal dorsal blotch about the ninth segment. Spots and hairs hardly discernible, head light brown with dark brown eyes and jaws, dorsal plate black or dark brown, anal plate faintly brownish, anterior legs black. When full-grown, pea-green, tinged with darker on the back, internal dorsal line visible, pulsating regularly, spots invisible, hairs distinct, head yellowish-brown, jaws brighter brown, plates pea-green, the dorsal plate having the posterior margin, and the anal, the anterior margin, dotted with blackish. Feet greenish. Or dull whitish, or very pale yellowish, with the entire dorsal region dull

grey, spots large, pale yellow, head very light brown, plates dull pale yellowish. Or pale yellow, with the whole dorsal region tinged with olive-green, spots paler and shining, head very pale brown, plates and legs yellowish.

All on *Spiræa ulmaria* spinning together the young (undeveloped) leaves, and living between them, often gnawing the young mid-rib, so as to cause the upper part of the leaf to dry up. Feeding up in the undeveloped tops, but quitting them when full-fed, to spin up among rubbish, or under the turned down edge of a dead leaf. Pupa light brown; moth emerging from the middle to the end of July. I am not aware that it feeds on any other plant. The moths are remarkably constant in colour and markings.

Peronea Lorquiniana, Dup. (*Bactra uliginosana*, Steph.).—The larva also reached me from Wicken Fen, collected there by my friend, Mr. F. D. Wheeler. It is moderately active, rather long, cylindrical, but with deeply divided segments; when young, pale pea-green, with a faintly powdery efflorescence, a darker green internal dorsal vessel, and hardly perceptible sub-dorsal lines; when older, yellowish-green, with the sub-dorsal lines more distinct. Head faintly brownish, without spots or markings; plates both shining green. In blossom spikes of *Lythrum salicaria*, feeding on the flowers in August. These were larvæ of the second brood, which should have produced the moths in the autumn, and some were reared by Mr. Wheeler and others, but mine died when full-grown.

Pembroke: 11th March, 1881.

NOTES ON THE LEPIDOPTERA OF THE VALAIS.

BY R. C. R. JORDAN, M.D.

In the early part of June, 1880, I spent a fortnight in the Visp and Saas Valleys, Mr. Geo. Baker, of Edgbaston, being with me; we both worked diligently at the *Lepidoptera* of the district, and with tolerable success. The following *Rhopalocera* were taken by us in addition to those recorded by me in a previous list as captured in June, 1878 (Ent. Mo. Mag., vol. xvi, p. 86).

Papilio Podalirius, common; at my last visit I only saw one.

Pieris Callidice, common above the tree-limit.

P. napi, *bryoniæ*, and the spotless males were, of course, common, but on the 15th of June, I caught one female *napi* between Zermatt and

St. Nicholas; it was in every way a well marked example of the second brood. *P. rapæ*, several examples were taken on the same day, also identical in appearance with the second brood.

Anthocharis Belia, common; I took one fine female in the Saas Valley, with the apical spot light grey, but the mark on the disc deep black.

Colias Edusa, var. *Helice*, Visp Valley.

Polyommatus Dorilis, var. *subalpina*, Visp Valley.

Lycæna Baton, Visp and Saas Valleys. *L. Icarus*, var. *Icarinus*. *L. Corydon*, Visp Valley. *L. Damon*, near Stalden, Visp Valley. *L. Sebrus*, I cannot quite make up my mind about this insect, the specimens caught, which were of both sexes, resemble *Sebrus* exactly in size, but in colour, and in the width of the black border, the males are very similar to *semiargus*, much more so than in the type examples of *Sebrus* in my cabinet; it may be a small race of *semiargus*: of course, this latter was abundant. *L. Cyllarus*, common in one field in the Saas Valley amongst *Vicia onobrychioides*; that field could not easily be forgotten, it was gay with flowers, *Machaon* and *Podalirius* were abundant, so also were *Apollo*, *Hyale*, *Athalia*, *Phæbe*, *Euphrosyne*, and many other butterflies; every now and then an *Ascalaphus*, with its straight undeviating flight, passed over head, whilst the dark velvet-looking *Erebia Evias* flitted over the grass, or a large black-winged *Bombus* settled on the blossoms. Such was the near scene, but the picture is very incomplete unless we remember that the Monte Rosa range bounds the Valley above, and that downwards we look on the snows of the Bernese Oberland. Amongst the *Lycænæ* taken were specimens of *Ægon*, *semiargus*, and *Arion*, all varying on one uniform plan, namely, the posterior half of the wing shaded deeply with black, gradually passing into blue, but the black margin filling quite the half of both upper and lower wings.

Nemeobius Lucina.

Vanessa comma, *Io*, and *Antiopa*, all worn, and evidently hibernated; larvæ of *Io* were also common at the same time on the nettles. *V. urticæ* was common, and in fine condition.

Melitæa Cinxia, Visp Valley.

Argynnis Dia.

Erebia Goante, Visp Valley.

Æneis Aëlle was common near Saas-im-Grund, in one stony part of the Valley; some fell to my lot, but my companion, who was fleet of foot than myself, caught several.

Pararge Megæra.

Epinephele Junira, near St. Nicholas, where, this visit, we took no *Lycaon*; it was probably too early for the latter.

Cænonympha Arcania, var. *Darwiniana*, I took a large series of this form, mostly in the Saas Valley; some of these specimens resembled *Arcania* enough to have been found amongst the typical species in a German wood, others, on the contrary, cannot be distinguished from the *Satyrion* of the High Alps. There is scarcely a break in the links from *Arcania* to *Satyrion*.

A *Syrichthus*, taken in the Saas Valley, seems to me distinct, but it is, perhaps, a variety of *Alveus*.

Nisoniades tages.

Hesperia lineola, *comma*, and *sylvanus*, taken in the Visp Valley.

At Aigle (Canton Vaud) *Argynnis Ino* and *Pararge Ægeria* were caught.

Ino globulariæ, one taken low down in the Visp Valley. The commonest species is *Geryon*, but there are two forms of *Statice* common, one with fewer scales on the wing and slightly different antennæ.

Zygæna filipendulæ.

Z. transalpina, Visp Valley.

At the Schwarze See the larvæ of *Zygæna exulans* were most abundant; Mr. Baker brought some of these home and reared them successfully.

The following list of *Bombyces* is incomplete, some species being as yet not satisfactorily determined by me, and, therefore, omitted.

Setina aurita, abundant, var. *ramosa*, common, occurring even in the birch region.

Gnophria rubricollis.

Emydia cribrum, var. *candida*.

Nemeophila plantaginis and *russula*.

Callimorpha dominula, Visp Valley.

Spilosoma mendica, Visp Valley.

Dasychira fascelina, Visp Valley.

Leucoma salicis, Visp Valley.

Porthesia similis (*auriflua*).

These last two were reared from larvæ found in the Valley. Mr. Baker reared a remarkable variety of the gold-tail moth, a male, with the ground colour a beautiful sulphur-yellow, instead of white.

Bombyx neustria and *castrensis*, both reared from larvæ. *B. lanestris*, larvæ abundant on birch near St. Nicholas in webs (not reared).

B. quercûs, larvæ found and reared; perfect insects caught.

Drepana falcataria, between Zermatt and St. Nicholas.

Cymatophora duplaris, Saas Valley.

Diloba cæruleocephala, larvæ abundant on *Prunus mahaleb* (not reared).

In this list of *Bombyces* the unrecorded insects are :

Nola, one or two species ; I am inclined to think all are *centonalis* but there is so much difference in shade, that, perhaps, there may be two kinds.

Setina, probably another species amongst the varieties of *aurita*.

Lithosia complana ?, the yellow is so much duller than in the type, that it may be different.

Gnophria quadra, taken at Sierre (not in either Visp or Saas Valleys).

Ocnogyna parasita, eggs of this moth were found (in the Valais) in our walk from Chamounix to Martigny. They were brought home, and Mr. Baker was successful in rearing the species. The female is especially curious, looking like a *Spilosoma*, with the wings of a female *Diurnea*. Four species of *Psychidæ* complete the list.

I shall not attempt at present to give the names of *Noctuæ* or *Geometræ*.

The few walnut-trees in the Visp Valley were as much disfigured by *Gracilaria juglandella* as my lilac bushes are by *G. syringella* at home. The box containing my *Micro-Lepidoptera* was by accident crushed quite flat, and none escaped.

The plumes not recorded in my former list (Ent. Mo. Mag., vol. xvi, p. 21) were *Leioptilus carphodactylus*, taken low down in the Visp Valley, and *Oxyptilus obscurus*, caught in the hilly field half way up the Riffel.

I hope time and opportunity will allow me to increase this list at some future day.

105, Harborne Road, Edgbaston, Birmingham :
March 11th, 1881.

A NEW SPECIES OF *DEGEERIA*.

BY H. N. RIDLEY.

In March, 1879, I took, under the dead bark of an elm tree, in a field near Cumnor, in Oxfordshire, several specimens of a *Degeeria* which I at first referred to *D. nivalis*, but, on recently examining them, I find them to be very distinct.

DEGEERIA PULCHELLA, *sp. n.*

Head yellow ; eyes black, connected by a black V-shaped band. First thoracic segment yellow, anterior margin black ; second segment black ; third yellow ; the

fourth segment (the first abdominal) black; the fifth yellow; the sixth yellow, margined with black, with an irregular black band running transversely across it, and extending on the under-surface so as to form almost a complete ring round the body; seventh segment black. There is also a lateral black line along the first two segments. The antennæ are twice the length of the head; the first and second joints yellowish, the third and fourth purplish, the articulations of the second and third are black. The legs are white, with black articulations. The spring white.

This insect is undoubtedly near *D. muscorum*, Nic., but is distinguished by the shorter antennæ, the black articulations of the antennæ and limbs, and the greater preponderance of black over the whole body.

The markings in the whole genus *Degeeria* are fundamentally the same, at least, in the yellow species, the great difference being caused by the variability in breadth of the black bands which margin the body-segments; this species has broader black bands than any other with which I am acquainted, which give it the appearance of being regularly banded with alternate black and yellow. The amount of black also varies in this species, apparently according to age; for, in a smaller and presumably younger specimen, the fifth segment is yellow margined with black, while in the adults, the black has extended entirely over the segment, leaving only a trace of the yellow, and in the younger specimen again, the articulations of the feet and the antennæ are rather grey than black. It is certainly the prettiest species that I have as yet seen.

20, Portsea Place, Connaught Square:
April, 1881.

ON PARTHENOGENESIS IN THE *TENTHREDINIDÆ*.

BY P. CAMERON.

My observations last year have enabled me to add two species to the list of parthenogenetic *Tenthredinidæ*; and to prove the occurrence of complete parthenogenesis in *Pæcilosoma pulveratum* and *Eriocampa ovata*.

A virgin ♀ of *Nematus pavidus*, Lep., laid a few eggs from which I obtained two males.

A specimen of *Taxonus glabratus*, Fall. (*agilis*, Kl.), bred from larvæ which fed up at the end of July, laid eight eggs, which were certainly fertile, but the larvæ perished in the eggs, owing to the food-plant drying up.

Five *Pæcilosoma pulveratum* laid in June from five to eleven eggs each, but out of that number only two larvæ became full-fed. On

examining these this week I found one larva dead and mouldy; the other had become an imago, but had died before getting rid of the pupal skin. It is a ♀.

Two *Eriocampa ovata* laid between them about fifty eggs, but most of the larvæ died young. Five, however, spun up, and one ♀ has just emerged in the perfect state. Unfortunately I can get no alder leaves at present to continue the experiment with this female.

Glasgow: 7th April, 1881.

DESCRIPTION OF A NEW GENUS AND TWO SPECIES OF *HEMIPTERA*-
HETEROPTERA FROM SOUTH AMERICA.

BY JOHN SCOTT.

The insects which I am about to describe are extremely interesting, on account of their furnishing, so far as I am aware, an additional link to the chain of the various ways by which the members of this group obtain an existence. They were forwarded to me some considerable time ago by my friend the Rev. O. Pickard Cambridge, who in his letter accompanying them, says: "they were found living *en famille* with colonies of spiders."

Family NABIDÆ, Fieb.

Genus *ARACHNOCORIS*.

Head, viewed from above, short, five-sided. *Antennæ*: 1st joint shortest, a little more than half the length of the 2nd; 2nd, 3rd and 4th sub-equal, the latter somewhat fusiform. *Eyes*, viewed from above, almost semi-globose. *Ocelli* small, inserted near the base of the head. *Rostrum* reaching to the end of the metasternum; 1st joint short, stout, a little more than twice as long as broad; 2nd about one-third longer than the 1st; 3rd longest; 4th about equal to the 1st.

Thorax—*pronotum* very much deflected towards the head, with a narrow collar in front; anterior margin about three times narrower than the posterior measured across the posterior angles; disc convex; posterior margin concave across the scutellum. *Scutellum* triangular, longer than the width across the base; apex acute. *Elytra* very much constricted from before to beyond the middle; *membrane* rounded at the apex, with about seven straight nerves, the fourth from the exterior margin furcate from the middle. *Legs*—*thighs*: 2nd pair incrassated with two rows of short teeth on the under-side, 3rd with a long stout tooth on the lower side of the base of the fulcrum: *tibiæ*: 2nd pair curved, stouter at the base than at the apex: *tarsi*: 1st joint shortest, 2nd about one-half longer than the 3rd.

Abdomen narrowed at the base.

This genus is very nearly allied to *Allæorhynchus*, Fieber, Eur. Hem., p. 159, but may be readily separated from it by the differences in the pronotum, legs, and elytra, the former, in the present genus, not being constricted beyond the middle, the next having the 2nd pair of thighs incrassated, and the last being constricted before the middle.

ARACHNOCORIS ALBOMACULATUS.

Elongate. *Head* and *antennæ* brown, base of the 2nd and 3rd joints of the latter narrowly pale, apical half of the 4th slightly paler than the basal half. *Pronotum* pitchy-black, very much deflected towards the head, finely punctured, except two callosities behind the collar; posterior angles slightly elevated; posterior margin deeply concave across the scutellum; extremities rounded. *Scutellum* pitchy-black, with a semicircular depression at the base; apex white, slightly elevated. *Clavus* and *corium* pitchy-black, shining, having a steel-blue appearance in certain lights, the latter constricted from before to beyond the middle, and with a white triangular patch; apex white: *membrane* brown. *Legs* pitchy-brown: *thighs*: 2nd pair incrassated with two rows of short teeth on the apical half of the lower margin. *Abdomen* pitchy-brown.

Head—*crown* brown, convex, with a faint transverse channel in front of the ocelli. *Antennæ* brown, sparingly clothed with short hairs; 1st joint projecting its entire length before the head, base of the 2nd and 3rd narrowly white, apical half of the 4th paler than the basal half. *Ocelli* brown, placed about in a line with the posterior margin of the eyes. *Rostrum* brown, reaching to the 3rd pair of coxæ; 1st joint stout, a little more than twice as long as broad, clothed with fine short hairs, 2nd about one-third longer than the 1st, 3rd longest, thinner than the 2nd, 4th about equal to the 1st.

Thorax—*pronotum* pitchy-black, very much deflected towards the head, finely punctured, with a narrow brown collar in front, behind which are two unpunctured shining callosities, separated by a slender faint channel; posterior angles slightly elevated; posterior margin deeply concave across the scutellum; extremities rounded. *Scutellum* pitchy-black, with a semicircular depression in front; apex white, slightly elevated. *Elytra* pitchy-black, shining, with a steel-blue appearance in certain lights, sparingly clothed with short fine hairs: *clavus* pitchy-black, shining, with a steel-blue appearance in certain lights: *corium* considerably constricted from before to beyond the middle, its length being occupied by a triangular white patch, its base about in a line with the apex of the clavus; apex white: *membrane* brown. *Legs* pitchy-brown; *thighs* pitchy-brown; 1st pair sparingly clothed with short semi-erect hairs, lower margin with stouter erect ones; 2nd pair incrassated, with two rows of short teeth on the apical half of the lower margin, base narrower than the apex; 3rd thinner and longer than the first: *fulcrum*: at the base with a long, stout, curved tooth: *tibiæ* pitchy-brown, sparingly clothed with short hairs; 1st pair dark brown, darkest at the apex; 2nd pitchy-brown, curved, thicker at the base than the apex; 3rd brown, base narrowly whitish-yellow: *tarsi*

brownish-yellow, sparingly clothed with short hairs; 1st joint shortest; 2nd longest, about one-half longer than the 3rd; 3rd brown.

Abdomen: underneath pitchy-brown, clothed with very short appressed hairs.
Length, $2\frac{1}{2}$ lines.

Taken at Rio Janeiro.

ARACHNOCORIS DISPAR.

Head yellowish or pale brownish-yellow. *Antennæ* yellowish or pale brownish-yellow; 1st joint projecting its entire length before the head, apex narrowly fuscous; 4th white, base narrowly and apex broadly fuscous. *Pronotum* considerably deflected towards the head, thickly and somewhat deeply punctured, anteriorly yellowish or pale brownish-yellow, posteriorly dark brown. *Scutellum* and *corium* dark purplish-brown: *membrane* brown, with a triangular white patch on the exterior margin adjoining the apex of the corium, and a whitish patch immediately opposite on the interior margin. *Legs* dark brown: *tibiæ*: 3rd pair yellowish, base and apex narrowly brown.

Head—*crown* yellowish or pale brownish-yellow, flattish convex. *Antennæ* yellowish or pale brownish-yellow; 1st joint slightly clavate, projecting its entire length before the head, narrowly fuscous at the apex; 4th white, fusiform, base narrowly and apex broadly fuscous. *Eyes* purplish-brown. *Ocelli* purplish-brown. *Rostrum* brown; 1st joint pale brownish-yellow, sparingly clothed with short pale hairs.

Thorax—*pronotum* considerably deflected towards the head; anterior two-thirds and lateral margins narrowly yellowish or pale brownish-yellow; posterior portion brown, the colour fading into the anterior portion; posterior angles slightly elevated; behind the collar a callosity extending almost from side to side, bounded posteriorly by a deep curved channel, in which are three or four deeper punctures; posterior margin concave across the scutellum; extremities rounded. *Scutellum* dark purplish-brown, depressed at the base. *Elytra* dark purplish-brown, sparingly clothed with hairs: *membrane* brown, with a triangular white patch on the exterior margin adjoining the apex of the corium, and a whitish patch immediately opposite on the interior margin. *Sternum* yellowish or pale brownish-yellow. *Legs* dark brown: *thighs*: all the pairs thinnest at the base; 1st and 2nd armed underneath with two rows of stout bristles: *tibiæ*: 3rd pair yellowish, base and apex narrowly brown.

Abdomen underneath dark brown. Length, $2\frac{3}{4}$ lines.

Taken at Para.

The pale head and pronotum, difference of colouring in the antennæ, absence of the triangular white spots on the corium, and pale hinder tibiæ, will readily lead to the separation of the species.

The wonderful resemblance these species have to those of *Pilophorus*, Hahn., and *Mimocoris*, Scott, will strike any observer at first sight as remarkable, but the ocelli settle the question at once.

NEW SPECIES OF LONGICORN COLEOPTERA ALLIED TO
COLOBOTHEA.

BY H. W. BATES, F.L.S.

The following descriptions refer to an interesting group of *Lamiidæ*, peculiar to Tropical America, which are closely allied to *Astynomus*, but differ in their narrow, laterally-compressed form of body, and the presence of a carina on each elytron, separating the vertical sides (epipleuræ) from the dorsal surface.

SYNCHYZOPUS CANCELLATUS.

S. geometrico affinis et similis, sed differt elytrorum signaturis. Purpureo-fuscus, sericeo-nitens, capite thoraceque flavis, illo vittis duabus frontalibus, hoc fascia lata dorsali fuscis; elytris marginibus (basi exceptis) fasciisque duabus, angustis, flavis, apice sinuato-truncatis angulo exteriori spinoso; antennis piceo-fuscis, articulis 4^{to} et 6^{to} basi albis. Long. $4\frac{1}{2}$ lin., ♀.

Differs from *S. geometricus*, of Nicaragua, chiefly in the fewer yellow lines of the elytra, which are so placed that each elytron may be said to have four large, square, silky-brown spots, separated from each other and the margins (except at the base) by narrow pale yellow lines. The thorax is much shorter than broad, with the sides moderately and regularly rounded in the middle. The lateral carina of the elytra is well marked near the base, but becomes obliterated before the middle. The ovipositor of the ♀ projects to the length of about one-twelfth of an inch beyond the elytra, and its dorsal plate is very acute at the tip, sharply grooved down the middle, and margined on the sides.

Yungas of La Paz, Bolivia (Buckley).

SYNCHYZOPUS LÆTUS.

Purpureo-fuscus, sericeo-nitens, capite antice lineis tribus (quarum mediana usque ad verticem continuata) thorace fascia angusta prope marginem anteriorem, alteraque latiori (medio interrupta) juxta marginem posteriorem, elytrisque utrinque maculis quatuor, pallide flavis; antennis nigris, articulis 3^{to}, 4^{to}, et 6^{to} basi albis; corpore subtus medio griseo, pectore utrinque macula alba. Long. $4\frac{1}{2}$ lin., ♀.

Very similar in form to *S. geometricus* and *cancellatus*, but differing widely in the markings of the elytra. These consist, on each, of four pale yellow spots or short fasciæ, viz.: one rounded on the disc towards the base, a fascia near the middle, and a second fascia considerably beyond the middle (neither reaching the suture nor the margin), and a triangular spot at the apex (broadest on the suture). The ovipositor differs from that of *S. cancellatus* by wanting the central groove of the upper segment. In the specimen described it is red and shining.

R. Moronas, Equador (Buckley).

SYNCHYZOPUS POLYSTIGMA.

Niger, capite antice genis et lineis tribus frontilibus (quarum mediana usque ad thoracis basin extensa) elytrisque utrinque maculis novem, flavis: antennis articulis 4^{to} et 6^{to} basi albis: corpore subtus griseo, lateribus cinereo-albo maculatis.

Long. 5 lin., ♀ (excl. ovipos.).

Distinct from all other described species by the central yellow vitta of the thorax, and the numerous pale markings of the elytra; the latter consisting, on each, of nine spots. These spots are:—one, the largest, central on the suture and common to both elytra; two, small, on the epipleuræ; four, also small, scattered over the basal half of the disc; one, rather larger and more transverse, towards the apex; and one on the apical margin. The whitish spots on the sides of the body beneath begin with two narrow belts on the flanks of the prothorax, and are continued, one on each sternal plate and ventral segment, to the apex. The thorax is rather more elongate than in the preceding species, its broadest part being much nearer the base, whence it tapers towards the apex. The elytra are considerably narrowed from base to apex. The ovipositor projects one-eighth of an inch beyond the elytra, and its dorsal segment is convex and ungrooved.

New Granada.

SYNCHYZOPUS DUPLEX.

Facies Colobothearum: elongato-angustus, nigro- vel purpureo-fuscus, sericeus, fronte lineis tribus, vertice vitta latiori usque ad thoracis marginem posteriorem extensa, elytrisque plaga macularia basali fasciisque flexuosis duabus versus apicem, carneo-ochraceis: thorace sub-cylindrico medio paullulum dilatato; elytris apice truncatis extus spinosis; antennis nigris vel piceis, articulis 4^{to} et 6^{to} basi cinereo-albis: subtus medio griseo lateribus dense cinereo-vittatim tomentosis.

Long. 4—5½ lin., ♂ ♀.

In colour and markings much resembling the species of *Colobothea*, but distinguished from that genus by the narrower thorax (slightly rounded in the middle), and by the ovipositor of the female being slender and projecting considerably beyond the tips of the elytra; both which characters are those of *Synchyzopus*. The upper segment of the ovipositor ends in a sharp point, and is plane above. The spotty, ochreous or pinky-ochreous patches of the elytra are spread very irregularly over the base, but in the middle and towards the apex they are condensed into transverse flexuous belts, and the apex has a large transverse spot of the same colour.

South Brazil, Bahia, Rio Grande.

SPARNA PLATYPTERA.

Facies generis Lyci, elytris paullo convexis, postice gradatim modice dilatatis, apice latissime obtusissime rotundatis, angulo exteriori breviter spinoso; nigra, vertice vitta mediana, thorace vitta laterali, elytrisque humeris fasciaque lata mediana

fulvis: thorace utrinque prope basin dilatato et subspinoso, deinde antice valde angustato; elytris sutura, costis duabus dorsalibus, alteraque laterali, elevatis: antennis nigris scapo longissimo. Long. $6\frac{1}{2}$ lin.

Differs from *Sparna lycoides* (Thoms.) chiefly in colour. The tawny spot on the shoulders is connected on each side, by means of a broadish vitta, with the median fascia of the same colour; but the epipleura, up to the base, and a large basal patch common to both elytra, as well as the apical third, remain black. The under-side and legs are black; the bases of only fore and middle femora being reddish.

Province of Paraná, Brazil.

CARNEADES PERSONATA.

Nigra, subtilissime purpureo-fusco sericata, thorace vitta dorsali latissima, elytris plaga communi basali oblonga (medio constricta) maculaque magna rotundata (gutta nigra includenti) versus apicem, et macula triangulari apicali, ochraceis, cinereo-marginatis: antennis nigris, articulis 4^{to}, 6^{to}, et 8^{to} basi albis, scapo ciliato; corpore subtus nigro, sternis utrinque ochraceo-plagiatis, ventre apice ochraceo: thorace subconico a basi usque ad apicem recte angustato: elytris apice truncatis, angulo exteriori longe spinoso, humeris acutis, carinis duabus lateralibus postice evanescentibus, dorso versus basin aspere et parce punctato. Long. 8 lin.

New Granada.

CARNEADES NODICORNIS.

Convexa, tuberculo centro-basali valde elevato, antennarum scapo apice subito fortissime clavato; supra, guttis nigris et rufis late variegata, fasciisque duabus purpureo-fuscis ochraceo-albo marginatis, interstitiis viridi-æneis sericeis: subtus ochraceo-cinereo, pedibus nigris cinereo-annulatis: antennis piceo-rufis, articulis apice nigris, 3^{to}, 4^{to}, et 6^{to} basi cinereis. Long. 6 lin.

A prettily-variegated species, differing from *C. superba*, the type of the genus, in the elytra having strongly-elevated centro-basal tubercles, and the antennal scape being more abruptly clavate. The shoulders of the elytra are prominent, and the lateral carinæ faint, as in that species; the apex is truncated and spined in a similar way. The thorax differs in its sides being prominent and slightly tuberculated in the middle; in colour it is black with reddish marks, and a broad ashy-white vitta on each side.

Equador (Buckley); Frontino, New Granada (Wallis).

CARNEADES RETICULATA.

Oblongo-elongata, albo-cinerea, elytris passim lineis et maculis nigris reticulatim variegatis; thorace supra inæquali, tuberculoque laterali prope basin, dorso litura nigra M-formi: elytris magis parallelis, medio dorso et lateribus fortiter carinatis, apice late truncatis, angulo exteriore valde producto et acuto. Long. 7—8 lin.

Frontino, New Granada (Wallis).

Prionocyphon serricornis in Kent.—Last year (in August or September) I took, in Kent, a small orange beetle, which I in vain tried to set properly, and, after breaking several of its legs, I was about to throw it away, but, on second thoughts, I carded it as it was.

A short time ago I took it to the British Museum, where Mr. C. O. Waterhouse recognised it as *Prionocyphon serricornis*, one of our rarest *Coleoptera*.

As I did not know of the insect's rarity when I captured it, I cannot tell what tree it was found on, but it was probably knocked off oak, nut, blackberry, or birch, as those four trees (especially the two former) are the most numerous in the locality. I have never seen it recorded from the south-east of England before, in fact, I believe only a very few specimens have been captured in this country.—E. A. BRUNETTI, 15, Lower Grosvenor Place : April 18th, 1881.

Stigmonota scopariana bred.—I have to-day bred three specimens from the larvæ mentioned at p. 70 of this volume. What a lovely species this is! but why on earth should it come out so early, when not a vestige of its food-plant will be seen for some weeks, in the bleak, cold region where it occurs?

That it appears to be known, however, as an April species is shown by the remarks of my friend Mr. C. G. Barrett at p. 36 of this volume.—J. B. HODGKINSON, 15, Spring Bank, Preston : April 10th, 1881.

Note on Trioza urticae.—The time is fast approaching for the capture of this species of *Psyllidæ* in all its stages, and I herewith give a short description of the *nymph* form of the creature, for the benefit of those who care to collect and breed it. In June and July these nymphs may be had in great numbers by beating the common nettle (*Urtica dioica*) into a net or, what I consider to be much preferable, an inverted umbrella. When taken home they should at once be placed upon a small plant of nettle set in a flower pot and covered with a glass shade, where they will thrive perfectly. The colour is pale green, shining, the entire margin has a fringe of white hairs, some of which, round the apex of the abdomen, are much longer than others. Head rounded in front. Antennæ pale, apex dusky. Eyes purplish-brown. Elytra-lobes almost white. Abdomen: upper-side sparingly clothed with long, fine, white hairs, and having a roundish pale yellow spot on each side near the base. Length about 1 line.—JOHN SCOTT, Lee, S.E. : April 15th, 1881.

Rare Hemiptera near Hastings.—On April 9th I was fortunate enough to take two specimens of *Gerris rufo-scutellata* at Guestling, one of our rarest British *Hemiptera*. Mr. E. Saunders has kindly verified them: on looking over my collection he also picked out four specimens of *Nabis lineatus*, = *Poweri*, Saund., which I had taken last September at Camber, and a developed specimen of *Stygnocoris rusticus* from the Hastings district, a species which is very rarely met with in this state.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea : 18th April, 1881.

Review.

MONOGRAPH OF THE BRITISH APHIDES, Vol. iii; by GEORGE BOWDLER BUCKTON, F.R.S., F.L.S., F.C.S., &c.: pp. 1—142, 28 plates, 8vo. London: Ray Society, 1881.

The issue by the Ray Society to its subscribers of this concluding volume of Mr. Buckton's work gives an occasion, which we gladly take, to confirm the generally favourable opinion of the result of the author's labours in a difficult field, which we gave on the appearance of the first volume (vol. xiii, p. 238); and the merits of the work are enhanced by the references made to the recent researches in the biology of *Aphides* by Lichtenstein, Riley, Courchet, Kessler, and others. In an introductory chapter, the author briefly discusses recent views of variation, development and evolution, coming to the conclusion that "Some inscrutable force is connected with the secret of life, with its metamorphic powers, and its attributes of irritability, assimilation, reproduction, and final death," which—a verbal amplification of Cuvier's dictum that "Life is a state of force"—contains the gist of the whole matter.

While we acknowledge the merits of the work and anticipate that great advantage will result to British Entomologists from the knowledge thus brought within their reach, we cannot but regret that so little heed has been given to the defects noted by several reviewers on the first occasion. It is true that the author has so far attended to his critics as to give "A List of Authors, with the approximate date of their Memoirs on Aphides," but this is a poor substitute for the usual indication in its place, of the work, volume, page and plate where the description or figure of a species is to be found; and endless labour is still entailed on those who would follow in the track of research. Another of the more important omissions is indication of the species, or reputed species, of Britain not accounted for in the work. We miss also a combined index to the contents of the three volumes.

At page 61 is characterized a new genus termed "*Stomaphis*, Walker," although it is acknowledged that Walker did not publish any of the generic characters, and only suggested the name. The genus will, of necessity, be always cited as *Stomaphis*, Buckton. Other similar instances might be referred to. In connection with the species on which the genus *Stomaphis* is founded (*Lachnus quercus*) is the following note, derived from Mr. Walker, containing errors which deserve to be corrected. "I think Tugall was the first person to discover *Aphis quercus* in England, and he mentioned it to Stephens, who published a notice thereon about 1847, but I do not find it mentioned in the list of writings of the latter author. About that time Tugall directed me to an oak near Dulwich where I found it; and some years after, the late Mr. Alfred Smee told me of an oak near Weybridge, where I found it again; and subsequently I met with it at Finchley. The male is mouthless, or rather, it has no rostrum." The true story is to be found in the "Transactions of the Entomological Society of London," vol. v, Proceedings, where, at page xx, it is recorded, that at the Meeting on the 2nd August, 1847, "Messrs. J. F. Stephens and Ingall exhibited specimens of *Lachnus quercus*, an Aphideous insect new to this country, found in crevices of bark of oak trees near Dulwich, thrusting its long proboscis nearly up to the base in the wood of the tree, so that it cannot be withdrawn without great difficulty and fear of injuring the insect, in which case the ants immediately

rush to suck up the fluids discharged by the *Lachnus*." At page xxvii it is stated that, at the Meeting on the 1st November, 1847, "Mr. Ingall exhibited specimens of the male of *Lachnus quercus*, remarkable for being destitute of the long rostrum of the female, and also eggs of the same species."

ENTOMOLOGICAL SOCIETY OF LONDON: 6th April, 1881.—W. L. DISTANT, Esq., Vice-President, in the Chair.

G. W. Royston Pigott, Esq., of Eastbourne, was elected an Ordinary Member and Dr. Signoret, of Paris, a Honorary Member.

Mr. Jenner Weir exhibited a beautiful *Noctua* bred in a nursery-garden at Blackheath, which he had not at present been able to identify. Although much resembling a *Gortyna* in colour, its general form rather indicated something allied to *Dicycla*.

Mr. McLachlan exhibited three species of the rare and curious Neuropterous genus *Dilar*, Rbr., viz.:—*D. nevadensis*, Rbr., from Andalusia (recently received from Dr. Staudinger), *D. Hornei*, McLach. (Ent. Mo. Mag., v, p. 239), from N.W. India, and *D. Prestoni*, McLach. (ante, p. 39), from Rio Janeiro. He called attention to the singular unilaterally-pectinate antennæ of the ♂ and the long slender ovipositor of the ♀, the latter indicating some undiscovered habit.

The Rev. A. E. Eaton exhibited (under the microscope) a wood-louse new to Britain, viz.: *Haplophthalmus elegans*, Schöbl, found by him in a garden at Croydon: it had been noticed from Germany and Denmark.

Miss Ormerod exhibited a black nest of a *Termes* from Guyana, attached to the branch of a tree; it bore some resemblance to a negro's head; only apterous forms of the insects had been found in it.

Mr. Pascoe exhibited the insects from a somewhat similar nest found by him at Pará.

Mr. McLachlan said he could not determine, with certainty, the species forming these nests without seeing winged-forms. The insects in Miss Ormerod's nest represented two forms of workers, those of the ordinary form, and others that have been termed "Abeiter Nasuti." In Mr. Pascoe's nest only the latter were apparently present; he thought they were probably *Termes opacus*, Hagen. He alluded to the works of Hagen, Fritz Müller, and Hubbard, on the subject.

Mr. Billups exhibited *Lasiosomus enervis*, H.-S., a very rare species of *Hemiptera*, found by him recently in moss, and of which only few other British specimens existed, taken by Mr. Champion at Chatham: also *Ichneumon erythræus*, Gravenhorst, a very rare British species of *Ichneumonidæ*.

Mr. McLachlan read a description of a new species of *Corduliina* (*Gomphomacromia fallax*) from Ecuador.

Mr. Bridgman communicated additions to Mr. Marshall's Catalogue of British *Ichneumonidæ*, in which he enumerated 60 species new to this country, 13 of which were apparently undescribed. In connection with this paper Mr. Fitch especially alluded to the genus *Pezomachus*, which would be found to be made up, to a large extent, of apterous females of several distinct genera.

	PAGE
Brahmæa from Japan, Description of a new species of	110
British Hemiptera, An additional species of	150
" " -Heteroptera, Capture of	165
" " " Remarks on some	10
" " -Homoptera, An additional species of	224
" Tortrices, Notes on	35, 82, 262
" Trichoptera, An addition to the	185
Bryophila par	115
Cæcilius pedicularius, Extreme abundance of	141
Capture of a rare Hymenopterous insect near Lyme	163
" " British Hemiptera-Heteroptera	165
" " Dyschirius angustatus, Ahr., at Hayling Island	93
" " Micra ostrina, M. parva, and Noctua flammatra	135
" " Sitaris muralis in the nest of Bombus terrestris	186
" " two of our rarer species of Homalota	116
Captures near Hastings	67
" of Coleoptera in the Forest of Dean, Recent	207
" " Hemiptera in 1880	234
" " Lepidoptera in the vicinity of London	137
Carabus clathratus, &c., in Ireland	42
Catocala fraxini near Lewes	134
Characters of new genera and Descriptions of new species of Geodephaga from the Hawaiian Islands	226
Charagochilus Gyllenhali macropterous	164
Chrysomelæ, On the eggs and larvæ of some, and other (allied) species of Phytophaga	150
Chrysopa pallida in Switzerland	141
Cidaria salicata, Note on	70
Clothilla picea, Motsch., Abundance of	185
Coccyx Oechsenheimeriana near Thetford	46
Coleoptera, Description of new Longicorn	275
" from Central America, Descriptions of two new species of	111
" in Sussex, Notes on	163
" " the Forest of Dean, Recent captures of	207
" " " Isle of Wight, Notes on	235
" " Notes on some scarce	140
" " Parthenogenesis in the	127
" " Prices of rare exotic	236
Colony of Ptinella denticollis in Warwickshire	186
Colorado Beetle!, Another	146
" Beetles in Devonshire	235
Coniopteryx lutea, Wallengren, Note on	21
Cossonidæ from the Hawaiian Islands, Description of four new species of	199
Crabro elongatulus, Notes on, and the other British species of Crabro with black bodies	3
Crambus culmellus, Natural History of	91
Cucujidæ in Japan, Notes on, with diagnosis of a new species	198
Cynipidæ, which produce oak-galls, Dr. Adler's second Memoir on Dimorphism in the	258
Damaster, Description of another new species of	159, 197
" " On the distribution of, with description of a new species	159
Degeeria, A new species of	270
Description of a new species of Brahmæa from Japan	110
" " " " " " Dolerus from Scotland	206
" " " " " " Lycænidæ from Penang	245

Description of a new species of <i>Torymus</i> from Scotland, with notes on the other British species of the genus, &c.	40
" " " " " " Trichoptera (<i>Polycentropus Kingi</i>) from Scotland ..	254
" " another new species of <i>Damaster</i> ..	159, 197
" " the larva of <i>Ephestia ficulella</i> ..	44
" " " " " <i>Euclidia glyphica</i> ..	210
" " " " " <i>Nonagria fulva</i> ..	114
" " " " " <i>Pempelia hostilis</i> ..	177
" " " nymph and imago of <i>Psylla peregrina</i> , Först. ..	65
" " " " of <i>Arytæna genistæ</i> , Lat. ..	132
" " " species of <i>Macropis</i> ...	31
Descriptions .. five species of Aculeate Hymenoptera unrecorded as British	97
" " four new species of <i>Cossonidæ</i> from the Hawaiian Islands ..	199
" " new species of <i>Geodephaga</i> , Characters of new genera and, from the Hawaiian Islands ..	226
" " two new species of <i>Coleoptera</i> from Central America ..	111
Destructive effects of <i>Anisoplia austriaca</i> in Russia ..	139
Diagnoses quatuor novarum <i>Pentatomidarum</i> ..	233
"Die Lepidopteren der Schweiz, von Professor Dr. H. Frey : " Review ..	118
Dilar in South America, Occurrence of the Neuropterous genus ..	39
Dimorphism among <i>Diptera</i> , Dr. F. Müller's discovery of a case of female ..	130, 206
" in <i>Paltostoma torrentium</i> , Female ..	225
" " the <i>Cynipidæ</i> , which produce oak-galls, Dr. Adler's second Memoir on ..	258
" of female <i>Blepharoceridæ</i> ...	206
<i>Diptera</i> , Dr. F. Müller's discovery of a case of female dimorphism among ..	130, 206
<i>Dipteron</i> new to Britain, A ; <i>Sapromyza bipunctata</i> ..	260
Discovery of a case of female dimorphism among <i>Diptera</i> , Dr. F. Müller's ..	130, 206
" " the winged form of <i>Protopistoma punctifrons</i> ..	46, 117
Distribution of <i>Damaster</i> , On the, with description of a new species ..	159
<i>Dolerus</i> from Scotland, Description of a new species of ..	206
Dr. Adler's Second Memoir on Dimorphism in the <i>Cynipidæ</i> which produce oak-galls ..	258
Dr. F. Müller's discovery of a case of female dimorphism among <i>Diptera</i> ...	130, 206
Dragon-flies of Switzerland, Two additions to the ..	141
<i>Drepana sicula</i> , Additional notes on the larva of ..	122
" " bred from the egg ..	121
<i>Dyschirius angustatus</i> , Ahr., at Hayling Island, Capture of ..	93
Early appearance of <i>Pieris rapæ</i> ..	258
" stages of <i>Hydrocampa nymphæalis</i> , Further notes on the ..	249
Eggs and larvæ, On the, of some <i>Chrysomelæ</i> and other (allied) species of <i>Phytophaga</i> ..	150
<i>Eidophasia Messingiella</i> at Hökendorf, near Stettin ..	45
<i>Elipsocus cyanops</i> , Rostock, a species new to Britain ..	21, 71
Entomological Society of London, Proceedings of the	47, 72, 96, 120, 167, 216, 240, 260, 280
Entomology in Suffolk, Reminiscences of ..	124
" of Portugal, Notes on the (Introductory) ..	73
" " " " " " (Neuroptera) ..	103
" " " " " " (Lepidoptera) ..	181, 229, 246
Ephemèridæ, An announcement of new genera of the ..	191
<i>Ephestia ficulella</i> , Description of the larva of ..	44
<i>Erebia Cassiope</i> at home...	148
<i>Eucalyptus</i> -Galls ..	145

	PAGE
Euclidia glyphica, Description of the larva of	210
Euphæa (Calopterygina), On the mode of the respiration of the larvæ of the genus	90
Euplectus punctatus in Sherwood Forest	69
Eupteryx stachydearum, Hardy, Note on	89
Exotic Rhynchota, Notes on	222
Extraordinary vitality of Otiorhynchus ambiguus	208
Extreme abundance of Cæcilus pedicularius	141
Facts in the Life-History of Gastrophysa raphani, Some	49
Faculty in insects, On an undefined	100
Female dimorphism in Paltostoma torrentium	225
Flies, A swarm of	142
Food of Bothynotus pilosus	176
„ „ Scopula lutealis	91
Food-plant for Laverna epilobiella, Römer, An additional	186
Further notes on the early stages of Hydrocampa nymphæalis	249
„ „ „ „ Natural History of Botys pandalis	156
Gall-making Lepidopterous larvæ, Australian	185
Galls, Eucalyptus... ..	145
Gastrophysa raphani, Some facts in the Life-History of	49
Generic name Pachymerus in Hemiptera, The	46
Geodephaga from the Hawaiian Islands, Characters of new genera and descriptions of new species of	226
Glow-worm, On the phosphorescence of the	94
Grapholitha nigricana, On the Life History of	155
Guenée, Death of Achille	214
Habits of Bombylius	161, 206
Hairs of Hymenoptera, Notes on the	201
Harpella bracteella near Hartlepool, Occurrence of	237
Hawaiian Islands, Characters of new genera and descriptions of new species of Geodephaga from the	226
„ „ , Descriptions of four new species of Cossonidæ from the	199
„ „ , Note on species of Aculeate Hymenoptera occurring in the	85
„ „ , On two small consignments of Lepidoptera from the	6
Helotidæ from Japan, A new species of	255
Hemiptera, An additional species of British	150
„ captured at Chobham, Notes on Hymenoptera and	68
„ in 1880, Captures of	234
„ „ Perthshire, Hibernating... ..	260
„ near Hastings, Sehirus biguttatus and other	260, 278
„ -Heteroptera, Capture of British	165
„ „ , Description of a new genus and two species of	272
„ „ , Remarks on some British	10
Hibernating Hemiptera in Perthshire	260
Hislop, Death of Robert	71
Hive Bees, The Red Clover and... ..	142
Homalota, Capture of two of our rarer species of	116
Homoptera, An additional species of British	224
„ „ , Two new European	89
How to find the larva of Triphæna subsequa	211
Hydrocampa nymphæalis, Further notes on the early stages of	249
Hymenoptera and Hemiptera captured at Chobham, Notes on	68
„ near Worcester in 1880, Notes on	212
„ „ , Notes on the hairs of	201

Hymenoptera occurring in the Hawaiian Islands, Notes on species of Aculeate	85
„ unrecorded as British, Descriptions of five species of Aculeate	97
Hymenopterous insect near Lyme, Capture of a rare	163
Ichneumon new to Britain, An, (<i>Mesolius rufilabris</i>)	236
Ichneumonidæ new to Britain	258
“Illustrations of Typical specimens of Lepidoptera-Heterocera in the collection of the British Museum. Part IV—North American Tortricidæ, by Lord Walsingham:” Review	95
“Insect Variety, its propagation and distribution, &c., by A. H. Swinton:” Review	143
Insects from Portugal	71, 73, 103, 181, 229, 246
„ in Japan	20
Intermittent light of <i>Luciola lusitanica</i> , Notes on the	94
Kirschbaum, Death of Professor	47
Koch, Death of Gabriel	240
Larva of <i>Batrachedra præangusta</i> , Strange habitat for the	45, 93
„ „ <i>Drepana sicula</i> , Additional notes on the	122
„ „ <i>Ephestia ficulella</i> , Description of the	44
„ „ <i>Euclidia glyphica</i> , „ „ „	210
„ „ <i>Nonagria fulva</i> , „ „ „	114
„ „ <i>Pempelia hostilis</i> , „ „ „	177
„ „ <i>Stauropus fagi</i> , Observations on the last moult of the	18
„ „ <i>Triphæna subsequa</i> , How to find the...	211
Larvæ of <i>Acronycta alni</i> at Bristol	186
„ „ Micro-Lepidoptera, Notes on unknown or little-known	15
„ „ Noctuæ, On the semi-looping habit of young	237
„ „ the genus <i>Euphæa</i> (<i>Calopterygina</i>), On the mode of respiration of the	90
„ „ <i>Triphæna pronuba</i> , Notes on the young	135
„ „ On the Eggs and, of some <i>Chrysomelæ</i> and other (allied) species of <i>Phytophaga</i>	150
<i>Lathridius filum</i> , Aubé, at Burton-on-Trent	260
<i>Laverna epilobiella</i> , Römer, An additional food-plant for	186
Lepidoptera from the Hawaiian Islands, On two small consignments of	6
„ in December, Unseasonable weather,	187
„ „ Pembrokeshire, Marsh	91
„ „ the vicinity of London, Captures of	137
„ „ „ West of Ireland, Notes on the	79
„ „ „ Yorkshire in 1880, Notes on	136
„ „ of the Valais, Notes on	267
„ „ taken in Roxburghshire in 1880, Notes on	257
Lepidopterous larvæ, Is the number of moults of, constant in the same species?	42
Life-History of <i>Gastrophysa raphani</i> , Some facts in the	49
„ „ „ <i>Grapholitha nigricana</i> , The	155
<i>Lipura</i> , A new species of	1
List of Micro-Lepidoptera for collectors	162
„ „ Muscidæ Calypteræ taken in a green-house	207
<i>Lithocharis castanea</i> , Gr., at Wimbledon	42
<i>Luciola</i> —the European Fire-fly	69, 94
<i>Lycænidæ</i> from Penang, Description of a new species of	245
<i>Machilis</i> , A new species of	2
Macro-Lepidoptera in the New Forest in 1880, Notes on	169
Macropis, Description of the species of	31
Macropterous forms in the genera <i>Blissus</i> and <i>Plinthisus</i>	164

	PAGE
Mamestra pomerana at Misdroy on the Baltic...	45
Marsh Lepidoptera in Pembrokeshire ...	91
(Mesolius rufilabris), An ichneumon new to Britain ...	236
Metamorphoses of Blepharoceridæ, On the ...	186
Micra ostrina at Dover ...	135
" " , M. parva, and Noctua flammatra, Capture of ...	135
Micro-Lepidoptera for collectors, A list of ...	162
" " , Notes on unknown or little-known larvæ of ...	15
Mode of respiration in the larvæ of the genus Euphæa (Calopterygina) ...	90
Monogamy, or the contrary in insects, Remarks on ...	211
"Monograph of the British Aphides, by G. B. Buckton:" Review...	279
"Monographie der Deutschen Psociden, von H. Kolbe:" Review ...	166
Moult, Is the number of, of Lepidopterous larvæ constant in the same species?	42
Mulsant, Death of Étienne ...	189
Musca hortorum, Fallen, On, and allied species ...	22
Muscidæ Calypteræ taken in a green-house, List of ...	207
Natural History of Botys pandalis ...	28, 156
" " , Crambus culmellus ..	91
Nemophora pilella in Lancashire ...	44
Neuroptera of the Upper Engadine in August, Trichoptera and ...	217
" -Planipennia, Notes on some, described by the late M. A. E. Pictet in his "Névroptères d'Espagne" (1865) ...	62
Neuropterous genus Dilar in South America, Occurrence of the ...	39
New European Homoptera, Two ...	89
" genera of the Ephemeridæ, An announcement of ...	191
" species of Acanthoderes (Coleoptera Longicornia, Family Lamiadæ)	58
" " , Deegeria, A ...	270
" " , Helotidæ from Japan ...	255
" " , Hemiptera-Heteroptera ...	272
" " , Lipura ...	1
" " , Longicorn Coleoptera, allied to Colebothea ...	275
" " , Machilis ...	2
Noctua C-nigrum in June ...	70, 139
" flammatra, Capture of Micra ostrina, M. parva, and...	135
Noctuæ, On the semi-looping habit of young larvæ of ...	237
Nonagria fulva, Description of the larva of ...	114
Notes from Guatemala ..	212
" " Japan ..	209
" on British Tortrices ...	35, 82, 262
" " Coleoptera in Sussex ...	163
" " " the Isle of Wight ...	235
" " Crabro elongatulus, and the other British species of Crabro with black bodies ...	3
" " Cucujidæ in Japan, with diagnoses of a new species ...	198
" " Exotic Rhynchota ...	222
" " Hymenoptera and Hemiptera captured at Chobham ...	68
" " " near Worcester in 1880 ...	212
" " Lepidoptera in Yorkshire in 1880 ...	136
" " " taken in Roxburghshire in 1880 ...	257
" " Macro-Lepidoptera in the New Forest in 1880 ...	169
" " Mr. Saunders' Synopsis of British Heterogyna and Fossorial Hymenoptera ...	236
" " some Neuroptera-Planipennia described by the late M. A. E. Pictet in his "Névroptères d'Espagne" (1865) ...	62
" " " scarce Coleoptera...	140

Notes on species of Aculeate Hymenoptera occurring in the Hawaiian Islands	85
„ „ Tenthredinidæ	66
„ „ Trioza urticæ	278
„ „ the Entomology of Portugal (Introductory)	73
„ „ „ „ (Neuroptera)	103
„ „ „ „ (Lepidoptera)	181, 229, 246
„ „ „ Hairs of Hymenoptera	201
„ „ „ intermittent light of <i>Luciola lusitanica</i>	94
„ „ „ Lepidoptera in the West of Ireland	79
„ „ „ „ of the Valais	267
„ „ „ young larvæ of <i>Triphæna pronuba</i>	135
„ „ „ unknown or little-known larvæ of Micro-Lepidoptera	15
Number of moults, Is the, of Lepidopterous larvæ constant in the same species?	42
Nymph and Imago of <i>Psylla peregrina</i> , Först., Description of the	65
„ „ of <i>Arytæna genistæ</i> , Lat., Description of the... ..	132
Observations on the last moult of the larva of <i>Stauropus fagi</i>	18
„ „ „ <i>Vaessa</i> in Japan	209
Occurrence in Herefordshire of <i>Pempelia hostilis</i> , with description of the larva	177
„ „ of <i>Harpella bracteella</i> near Hartlepool	237
„ „ „ <i>Tachinus rufipennis</i> , Grav., near Barnstaple	42
„ „ „ the Neuropterous genus <i>Dilar</i> in South America	39
<i>Ocyusa picina</i> in Warwickshire	208
<i>Oligoneuria rhenana</i>	163
<i>Ophion minutum</i> at Hastings	236
<i>Orgyia antiqua</i> , The abundance of	114, 133
Ornithoptera Brookeana, Wall.	237
<i>Orthezia</i> , On the species of the genus	172, 203
<i>Otiorhynchus ambiguus</i> , Extraordinary vitality of	208
„ „ „ <i>ligustici</i> , &c., in the Isle of Man	117
<i>Pachymerus</i> in Hemiptera, The generic name	46
<i>Paltostoma torrentium</i> , Female dimorphism in	225
Parthenogenesis in Tenthredinidæ, On	180, 271
„ „ „ the Coleoptera	127
<i>Pempelia hostilis</i> , &c., near Colchester	237
„ „ „ The occurrence in Herefordshire of, with description of the larva	177
<i>Pentatomidarum</i> , Diagnoses quatuor novarum... ..	233
<i>Phosphænus hemipterus</i> at Hastings	116
Phosphorescence of the Glow-worm, On the	94
Phytophaga, On the eggs and larvæ of some <i>Chrysomelæ</i> and other (allied) species of	150
<i>Pieris rapæ</i> , Early appearance of	258
<i>Plegaderus dissectus</i> in Warwickshire	208
<i>Plinthisus</i> , Macropterous forms in the genera <i>Blissus</i> and	164
<i>Plutella</i> (allied to <i>P. cruciferarum</i>), On the singular new species of, collected in Spitzbergen, in 1873, by the Rev. A. E. Eaton	108
<i>Polia nigrocincta</i> at sugar in South Wales	134
Prices of rare Exotic Coleoptera	236
<i>Prionocyphon serricornis</i> in Kent	278
Proceedings of the Entomological Society of London	
47, 72, 96, 120, 167, 216, 240, 260, 280	
<i>Prosopistoma punctifrons</i> , Discovery of the winged form of	46, 117

<i>Psylla peregrina</i> , Först., Description of the nymph and imago of	65
<i>Ptinella denticollis</i> in Warwickshire, A colony of	186
Pursuit of Entomology under difficulties in Belgium	166
<i>Pyroderces argyrogrammos</i> bred	139
Recent captures of Coleoptera in the Forest of Dean... ..	207
Red Clover and Hive Bees	142
Remarks on monogamy, or the contrary in insects	211
„ „ some British Hemiptera-Heteroptera	10
Reminiscences of Entomology in Suffolk	124
Respiration in the larvæ of the genus <i>Euphæa</i> (<i>Calopterygina</i>), On the mode of	90
<i>Rhynchota</i> , Notes on Exotic	222
<i>Sapromyza bipunctata</i> ; a Dipteron new to Britain	260
<i>Scopula lutealis</i> , Food of... ..	91
<i>Sehirus biguttatus</i> and other Hemiptera near Hastings	260
Semi-looping habit, On the, of young larvæ of Noctuæ	237
<i>Sericomyia borealis</i> near Hastings	260
<i>Sesia myopæformis</i> in Lancashire, <i>Bapta taminata</i> and	70
Singular new species of <i>Plutella</i> (allied to <i>P. cruciferarum</i>) collected in Spitzbergen, in 1873, by the Rev. A. E. Eaton	108
<i>Sitaris muralis</i> in the nest of <i>Bombus terrestris</i> , Capture of	186
<i>Sitones ononidis</i> in Suffolk	163
Some facts in the Life-History of <i>Gastrophysa raphani</i>	49
“Souvenirs Entomologiques: Études sur l'instinct et les mœurs des Insectes, par J. H. Fabre:” Review... ..	117
Species of <i>Macropis</i> , Description of the	31
„ „ the genus <i>Orthezia</i> , On the	172, 203
<i>Stauropus fagi</i> , Observations on the last moult of the larva of	18
<i>Stigmonota scopariana</i> , a Tortrix new to our list	38, 70, 278
Strange habitat for the larva of <i>Batrachedra præangusta</i>	45, 93
Stridulation of <i>Acherontia</i> , On the	238
Swarm of flies	142
<i>Tachinus rufipennis</i> , Grav., near Barnstaple, Occurrence of	42
<i>Tapinostola Bondi</i> at Lyme Regis	134
Tenthredinidæ, Notes on	66
„ „ On Parthenogenesis in	180, 271
“The Butterflies of North America, by W. H. Edwards:” Review	189
“ „ Geological Antiquity of Insects, by Herbert Goss, F.L.S.:” Review ..	47
“ „ Transactions of the Yorkshire Naturalists' Union:” Review... ..	142
“ „ Young Naturalist: an illustrated penny weekly Magazine of Natural History, conducted by J. E. Robson and S. L. Mosley:” Review	188
Tortrices, Notes on British	35, 82, 262
<i>Torymus</i> from Scotland, Description of a new species of, with notes on other British species of the genus, &c.	40
Trichoptera, An addition to the British	185
„ and Neuroptera of the Upper Engadine in August	217
„ (<i>Polycentropus Kingi</i>) from Scotland, Description of a new species of	254
<i>Trioza urticæ</i> , Notes on	278
<i>Triphæna pronuba</i> , Notes on the young larvæ of	135
„ subsequa, How to find the larva of	211
Tropical Notes	241
Two additions to the Dragon-flies of Switzerland	141
„ small consignments of Lepidoptera from the Hawaiian Islands ...	6

	ix.
	PAGE
Undefined faculty in insects, On an	100
Unseasonable weather: Lepidoptera in December	187
Vanessa Antiopa at Box Hill	113
" " " Eastbourne	113
" " " Guildford	134
" " " Headeorn	113
" " " Herne Bay	113
" " " Tunbridge	113
" " " in Berkshire	113
" " " Devon	113
" " " Kent	113
" " " near Birmingham	113
" " " Virginia Water	113
" cardui double-brooded	43
" in Japan, Observations on	209
Variety of <i>Aretia villica</i> , Beautiful	162
<i>Vespa norvegica</i> in Yerkshire	237
Vitality of <i>Otiorhynchus ambiguus</i> , Extraordinary	208
Winged form of <i>Prosopistoma punctifrons</i> , Discovery of the	46, 117
<i>Xylina furcifera</i> (conformis) bred	134
Young larvæ of Noctue, On the semi-looping habit of	237
" " " <i>Triphæna pronuba</i> , Notes on the	135
<i>Zelleria insignipennella</i> bred	116
"Zoological Classification, by F. P. Pascoe, Second Edition:" Review	119

INDEX OF SUBJECTS NOTICED IN THE PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF LONDON.

	PAGE
<i>Acontia solaris</i> at Eastbourne... ..	167
Annual Meeting	240
<i>Apatura Ilia</i> said to have been captured in England	168
<i>Aretia caja</i> bred under coloured glass	47
" <i>fuliginosa</i> with one antenna congenitally absent	48
<i>Arescus histrio</i> , Variation in	216
<i>Argas persicus</i> , Habits of	72
<i>Argynnis Selene</i> , Varieties of	167
Blattidæ from Pernambuco, Singular species of	260
Buprestidæ from Madagascar, New species of	167
Butterfly in <i>copulâ</i> with moth	72
<i>Calamia lutosa</i> in London	261
<i>Camponotus</i> with distended abdomen, from Australia	48
<i>Camptogramma bilineata</i> attacked by fungi	120
<i>Carabus auratus</i> in London	48
Cases of Lepidopterous larvæ from South Africa, Singular	168
<i>Cetonia aurata</i> and <i>Protactia Bensoni</i>	48
<i>Cirrochroa Aoris</i> , Gynandromorphism in	48
Cobham Journals	48
Coccidæ from New Britain, Species of	260
Coleoptera in granaries	216
Colorado Beetles in Devonshire	262
Cynipidæ, Dimorphism in	262

Dahlia attractive to insects	...	...	...	...	...	...	47
Descriptions on covers of periodicals	...	...	...	...	...	...	167
Dilar, Species of	...	...	...	...	...	...	280
Dimorphism in Cynipidæ	...	...	...	...	...	...	262
Diptera, New species of exotic	...	...	...	...	...	...	168
Dorylus helvolus, Supposed female of	...	...	...	...	...	...	72, 168
Dynastidæ, Larvæ of, attacked by fungi	...	...	...	...	...	...	261
Ecuador, New species of Odonata from	...	...	...	...	...	...	261
Ennomos angularia, Gynandromorphism in	...	...	...	...	...	...	167
„ tiliaria, Variety of	...	...	...	...	...	...	261
Epione vespertaria, Dwarfed varieties of	...	...	...	...	...	...	168
Epunda lutulenta, Variety of...	...	...	...	...	...	...	168
Eucalyptus, Galls on	...	...	...	...	...	...	168
Fungi attacking insects	...	...	...	...	...	...	72, 120, 261
Galerucidæ, New species of	...	...	...	...	...	...	261
Granaries, Coleoptera in	...	...	...	...	...	...	216
Guatemala, Insects from	...	...	...	...	...	...	260
Gynandromorphism in Cirrochroa Aoris	...	...	...	...	...	...	48
„ „ Ennomos angularia	...	...	...	...	...	...	167
„ „ Smerinthus populi	...	...	...	...	...	...	167
Haplophthalmus elegans from Croydon	...	...	...	...	...	...	280
Hemiptera from Japan, New species of...	...	...	...	...	...	...	216
Heptaulacus villosus from Box Hill	...	...	...	...	...	...	96
Hilipus, New species of	...	...	...	...	...	...	262
Hops, Damage to, by a Dipterous larva	...	...	...	...	...	...	167
Hylechthrus bred from Prosopis	...	...	...	...	...	...	120
Hymenoptera of New Zealand	...	...	...	...	...	...	261
„ „ Synopsis of British Heterogynous and Fossorial	...	...	...	...	...	...	168
Ichneumon erythræus, Capture of	...	...	...	...	...	...	280
Ichneumonidæ, Additions to British	...	...	...	...	...	...	280
Japan, New species of Hemiptera from	...	...	...	...	...	...	216
Lampyridæ, Revision of	...	...	...	...	...	...	48
Lasiosomus enervis, Capture of	...	...	...	...	...	...	280
Lepidoptera, Varieties of British	...	...	...	...	...	...	167
Locusts from the Troad, Parasites on eggs of	...	...	...	...	...	...	168
Luciola, Luminosity of	...	...	...	...	...	...	120
Madagascar, Buprestidæ from	...	...	...	...	...	...	167
„ Platyleura from	...	...	...	...	...	...	261
Mangalore, Moths from	...	...	...	...	...	...	48
Moth in copulâ with Butterfly	...	...	...	...	...	...	72
New Britain, Coccidæ from	...	...	...	...	...	...	260
„ Zealand, Hymenoptera of	...	...	...	...	...	...	261
Noctua c-nigrum captured in June	...	...	...	...	...	...	72
Noctuidæ, An exotic species of, bred at Blackheath	...	...	...	...	...	...	280
Nyssia hispidaria, Variety of	...	...	...	...	...	...	48
Odonata from Ecuador, New species of	...	...	...	...	...	...	261, 280
Odonestis potatoria, Varieties of	...	...	...	...	...	...	120
Papilio Merope and its polymorphic females	...	...	...	...	...	...	168
Periodicals, Descriptions on covers of	...	...	...	...	...	...	167
Peripatus novæ-zealandiæ	...	...	...	...	...	...	261
Pezomachus, New British species of	...	...	...	...	...	...	216, 261
Phasmidæ from St. Vincent	...	...	...	...	...	...	216
Platyleura from Madagascar, New species of	...	...	...	...	...	...	261
Polyblastus Wahlbergi at Ashtead	...	...	...	...	...	...	120

	xi. PAGE
Polycetenes, New species and affinities of	216
Prosopis rubicola, Stylopized females of	96
Protactia Bensoni and Cetonia aurata	48
Ptyelus Godarti, Variation in... ..	48
Pyrallis saccharalis	72
Pyrophorus causticus alive	167
Rhododendron, Gall on	96
Rhynchota, New exotic species of	96
St. Vincent, Phasmidæ from	216
Scleroderma, Notes on	120, 167, 168, 262
Smerinthus ocellatus, Variation in larvæ of	120
„ populi, Gynandromorphous	167
Sugar-cane borers	72
Tanacetum vulgare, Galls on	120
Terias, The species of	167
Termites, Nests of	280
Fischeria gaunacella	216
Froad, Parasites on eggs of locusts from the	168
Vanessa Antiopa at Wimbledon	167
„ cardui, Variety of	72
Varieties of British Lepidoptera	167
Vegetable caterpillar from New Zealand	72
Wood-lice, New British species of	280

SPECIAL INDEX.

COLEOPTERA.		PAGE		PAGE
anthoderes abstersus (sp. n.),	H. W. Bates	60	Chrysomela Banksi	152
carinicollis " "		61	fastuosa	152
crocostigma " "		61	polita	152
flexistigma " "		61	varians	151
lætificus " "		60	Cryptocephalus frontalis	163
leucodryas " "		61	Cucujus coccinatus (sp. n.), Lewis	198
longitarsis " "		58	Mniszechi	198
luctuosus " "		60	Cyclothorax lætus (sp. n.), T. Blackburn..	228
pupillatus " "		60	robustus " "	228
satanas " "		58	unctus " "	227
subtessellatus " "		59	Damaster capito (sp. n.), Lewis	197
Thammi " "		59	Fortunei	160
vetustus " "		58	Lewisi	159
zonatus " "		59	pandurus	160
chromenus putealis (sp. n.),	T. Blackburn	227	viridipennis (sp. n.), Lewis.....	161
isoplia austriaca		139	Disenochus terebratus (sp. n.),	T. Blackburn 227
notheorus ignavus (sp. n.), T. Blackburn		201	Doryphora 10-lineata in Devon	285
embidium spurcum " "		228	Dyschirius angustatus	93
teres " "		229	extensus	163
edius tricornis		163	Euplectus nigricans	208
unicornis		163	punctatus	69, 140
urabus clathratus... ..		42	Gastrophysa raphani	49, 127, 154
urneades nodicornis (sp. n.), H. W. Bates		277	Helota cereo-punctata (sp. n.), Lewis.....	255
personata " "		277	Homalota planifrons	116
reticulata " "		277	princeps.....	116

Hydroporus marginatus	140
Lathridius filum	260
Lithocharis castanea	42
maritima	235
Luciola lusitanica	69, 94
Micropeplus tesserula	140
Ocyusa picina	208
Odontæus mobilicornis	67
Oodemas infernum (sp. n.), T. Blackburn	199
Olindæ " "	199
substrictum " "	200
Otiorrhynchus ambiguus	208
ligustici	117
Phosphæus hemipterus	116
Phyllopertha horticola	140
Plegoderus dissectus	208
Prionocyphon serricornis	278
Ptinella denticollis	186
Sitaris muralis	186
Sitones ononidis	163
Smilicerus Belti (sp. n.), Sharp	111
Sparna platyptera (sp. n.), H. W. Bates... ..	276
Synchyzopus cancellatus (sp. n.), H. W. Bates	275
duplex (sp. n.), "	276
lætus " "	275
polystigma " "	276
Tachinus rufipennis	42
Tesserocerus Belti (sp. n.), Sharp	112

DIPTERA.

Blepharoceridæ, Dimorphism in...	131, 186, 206, 225
Bombylius, Habits of	161, 206
Dilophus vulgaris	142
Morellia curvipes	27
hortorum	25
podagrica	26
simplex	24
Sapromyza bipunctata	260
Sericomyia borealis.	260

HEMIPTERA.

Acalypta cerviua	260
parvula, developed	260
Acanthia versus Salda	14
Aleurodes vaccinii	89
Anoterops setulosus	234
Apiomerus Oberthuri (sp. n.), Distant ...	222
Arachnocoris albo-maculatus (sp. n.), Scott	273
dispar " "	274
Aspongopus nigro-æneus (sp. n.), Reuter...	231

Atractotomus magnicornis.....	165, 234
Blissus Doriæ, macropterus	165
Bothynotus pilosus, developed ♀	165, 176
Bryocoris pteridis, developed	68
Capsus scutellaris	69
Carbula amurensis (sp. n.), Reuter	233
obtusangula " "	233
Charagochilus Gyllenhali, macropterus... ..	164
Coccus comari.....	90
Dicyphus stachydis	166, 234
Dorthesia vide Orthezia	
Edessa fuscidorsata (sp. n.), Reuter	234
Eupteryx stachydearum	89
Eusarcoris melanocephalus	68
Fulgoridæ	214
Gerris rufo-scutellata	278
Globiceps flavo-maculatus	12, 13
fulvipes	12, 13
salicicola (sp. n.), Reuter.....	13
selectus	12
Gnathodus punctatus, hibernating	260
Leptopterna ferrugata, developed	69
Lygus atomarius	150
limbatus	165
Nabis lineatus	278
Neides parallelus	10
tipularius	10
Orthezia cataphracta	173
characias	174, 204
chiton	173
Delavauxi	203
dispar	204
dubius	174
floccosus	174
glechomæ	175
Signoreti	173, 205
urticæ	173, 174
uva	203
Orthotylus diaphanus	12
prasinus	12
Scotti	12
striicornis	11
viridinervis	11
Pachymerus, name revived	46
Pentatoma baccarum.....	10
Pithanus Mærkeli, developed	69, 260
Plinthisus convexus, macropterus	165
Psylla peregrina	65
Salda c-album.....	14
elegantula	15
pallipes	15
pilosella.....	15
saltatoria	14
stellata	14
vestita	14

	PAGE
<i>Scolopostethus affinis</i>	10, 11
<i>decoratus</i>	10, 11
<i>ericetorum</i>	10, 11
<i>pilosus</i>	15
<i>Sehirus biguttatus</i>	259
<i>Strachia festiva</i>	234
<i>Trioza urticae</i>	278
<i>Triquetra intermedia</i> (sp. n.), Distant.....	223
<i>Typhlocyba Douglasi</i>	224
<i>Lethierryi</i> (sp. n.), Edwards.....	224
<i>rosæ</i>	224

HYMENOPTERA.

<i>Agenia variegata</i>	236
<i>Agrothereutes batavus</i>	258
<i>Andrena lucens</i>	99
<i>Apis mellifica</i>	86
<i>Aporus unicolor</i>	236
<i>Astata stigma</i>	69
<i>Athalia ancilla</i>	67
<i>scutellariæ</i> (sp. n.), Cameron.....	66
<i>Camponotus sexguttatus</i>	88
<i>Crabro</i> , British species of	3
<i>affinis</i>	87
<i>aphidum</i>	236
<i>denticornis</i>	87
<i>mandibularis</i>	87
<i>signatus</i>	236
<i>stygius</i> (sp. n.), Kirby.....	88
<i>unicolor</i>	87
<i>Didineis lunicornis</i>	163, 236
<i>Dolerus scoticus</i> (sp. n.), Cameron	206
<i>Eriocampa ovata</i>	180, 272
<i>Evania lævigata</i>	89
<i>Hemichroa rufa</i>	180
<i>Leptogenys insularis</i>	88
<i>Leptothorax Nylanderi</i>	69
<i>Lissonota leucozona</i>	258
<i>Macropis ciliata</i> (sp. n.), Patton	31
<i>labiata</i>	35
<i>patellata</i> (sp. n.), Patton	33
<i>Megachile diligens</i>	86
<i>Mesolius rufilabris</i>	236
<i>Nematus curtispina</i>	21
<i>miliaris</i>	21
<i>palliatu</i> s	21
<i>pallidus</i>	21
<i>pavidus</i>	271
<i>Odynerus agilis</i>	87
<i>Blackburni</i> (sp. n.), Kirby	87
<i>congruus</i>	87
<i>dubiosus</i>	87
<i>extraneus</i> (sp. n.), Kirby.....	86
<i>localis</i>	86

<i>Odynerus maurus</i>	86
<i>montanus</i>	87
<i>rubritinctus</i>	86
<i>Ophion minutum</i>	236
<i>Oxybelus mandibularis</i>	236
<i>Pelopæus flavipes</i>	86
<i>Pheidole pusilla</i>	89
<i>Phyllotoma vagans</i>	180
<i>Pison aurifer</i>	88
<i>hospes</i>	88
<i>iridipennis</i>	88
<i>Pœcilosoma pulveratum</i>	271
<i>Pompilus abnormis</i>	68
<i>cellularis</i>	97
<i>minutulus</i>	97
<i>neglectus</i>	68, 97
<i>Wesmaeli</i>	98
<i>Ponera contracta</i>	88, 236
<i>Prenolepis clandestina</i>	88
<i>Priocnemis parvulus</i>	68, 98
<i>pusillus</i>	99
<i>Prosopis Blackburni</i>	85
<i>facilis</i>	85
<i>flavifrons</i> (sp. n.), Kirby	85
<i>fuscipennis</i>	85
<i>hilaris</i>	85
<i>volatilis</i>	85
<i>Solenopsis geminata</i>	89
<i>Tapinoma polita</i>	236
<i>Tetramorium guineense</i>	88
<i>Torymus campanulæ</i> (sp. n.), Cameron ...	40
<i>caudatus</i>	41
<i>juniperi</i>	40
<i>sodalis</i>	40
<i>tipularum</i>	40
<i>viridis</i>	40
<i>Vespa norvegica</i>	237
<i>Xylocopa æneipennis</i>	86

LEPIDOPTERA.

<i>Acidalia camparia</i>	183
<i>emutaria</i>	170
<i>nexata</i>	183
<i>rubricata</i>	124, 125, 126
<i>straminata</i>	170
<i>Acontia luctuosa</i>	124
<i>Acrobasis glycerella</i>	231
<i>Acronycta alni</i>	171, 186
<i>ligustri</i>	258
<i>Agrophila sulphuralis</i>	124, 125
<i>Agrotis saucia</i>	69, 137
<i>suffusa</i>	7, 137
<i>Amphisa Gerningiana</i>	149
<i>Anarta melanopa</i>	57
<i>Anesychia funerella</i>	246

	PAGE
<i>Anthocharis Belemia</i> , var. <i>Glauce</i>	181
<i>Belia</i>	268
<i>Anthometra plunularia</i>	184
<i>Anticlea derivata</i>	257
<i>sinuata</i>	126
<i>Aplecta occulta</i>	258
<i>Arctia fuliginosa</i>	257
<i>villica</i>	162
<i>Argynnis Paphia</i> , var. <i>Valezina</i>	169
<i>Argyresthia ærariella</i>	46
<i>Argyrolepis Schreibersiana</i>	126
<i>zephyrana</i> , Larva of	37
<i>Asarta æthiopella</i>	231
<i>alpicolella</i>	231
<i>rubricosella</i>	230
<i>Asthenia scopariana</i>	35, 38, 70
<i>Athroolopha pennigeraria</i>	184
<i>Bactra furfurana</i>	91
<i>Bapta taminata</i>	70
<i>Batrachedra præangusta</i>	45, 93
<i>Bombyx mori</i>	212
<i>Botys pandalis</i> , Larva of	28, 156
<i>Brahmæa nigrans</i> (sp. n.), Butler	110
<i>Bryophila glandifera</i>	115
<i>par</i>	115
<i>Butalis acanthella</i>	248
<i>Calamia lutosa</i>	258
<i>Calocampa exoleta</i>	258
<i>vetusta</i>	79, 258
<i>Calosetia nigromaculana</i>	81
<i>Camptogramma fluviata</i>	91
<i>Caradrina venosa</i> (sp. n.), Butler	7
<i>Catocala fraxini</i>	134
<i>Catoptria æmulana</i>	83
(<i>Grapholitha</i>) <i>tripoliana</i> (sp. n.), Barrett	84
" " " , Larva of	84
<i>Celæna Haworthii</i>	258
<i>Cerostoma persicella</i>	246
<i>scabrella</i>	137
<i>Cheimatobia boreata</i>	257
<i>Chelonia plantaginis</i>	90, 257
<i>Chesias spartiata</i>	258
<i>Chilo mncronellus</i>	81
<i>Cidaria populata</i>	257
<i>psittacata</i>	170, 257
<i>salicata</i>	70, 257
<i>Cledeobia moldavica</i> (netricalis)	229
<i>Cleodora lineatella</i>	247
<i>Cleora glabraria</i>	170
<i>Clostera reclusa</i>	126, 170
<i>Coccyx Ochsenheimeriana</i>	46

	PAGE
<i>Cochylis punctiferana</i> (sp. n.), Ragonot ..	232
<i>respirantana</i>	232
<i>Cœnonympha Arcania</i> , var. <i>Darwiniana</i> ...	269
<i>Coleophora ardeæpennella</i>	137
<i>currucipennella</i>	137
<i>ibipennella</i> ..	137
<i>Collix sparsata</i>	137, 170
<i>Corycia temerata</i>	81
<i>Crambus alpinellus</i>	15
<i>cassentiniellus</i>	17, 230
<i>contaminellus</i>	17
<i>craterellus</i> (rorellus)	17, 230
<i>culmellus</i>	17
" , Larva of	91
<i>dumetellus</i>	15
<i>ericellus</i>	16
<i>fascelinellus</i> (aridellus)	17
<i>furcatellus</i>	16
<i>hamellus</i>	16
<i>inquinatellus</i>	17
<i>latistrius</i>	16
<i>lithargyrellus</i>	17
<i>margaritellus</i>	16
<i>myellus</i> (conchellus)	16
<i>pascuellus</i>	16
<i>perlellus</i>	16
<i>pratellus</i> , var. <i>alfacarellus</i>	230
<i>silvellus</i> (adipellus)	16
<i>uliginosellus</i>	16
<i>verellus</i>	15
<i>warringtonellus</i>	17
<i>Cryptoblabes bistriga</i>	238
<i>Cymatophora duplaris</i>	80
<i>ridens</i>	171
<i>Cynthia cardui</i>	43, 169
<i>Danaïs Archippus</i>	6
<i>Deilephila livornica</i>	7
<i>Demas coryli</i>	169
<i>Dianthœcia irregularis</i>	125, 126
<i>Dicranura furecula</i>	126, 170
<i>Dicycla oo</i>	125
<i>Drepana sicula</i> , Larva of	121, 122
<i>unguicula</i>	170
<i>Eidophasia Messingiella</i>	45
<i>Enmelesia alchemillata</i>	82
<i>blandiata</i>	82
<i>Ephestia ficulella</i> , Larva of	44
<i>Epinephile Ida</i>	183
<i>Pasiphaë</i>	183
<i>Epischnia illotella</i>	231
<i>Epunda viminalis</i>	258
<i>Erastria fuscula</i>	171
<i>Erebia Cassiope</i>	148
<i>Evias</i>	268
<i>Goante</i>	268

	PAGE
<i>Eromene ocella</i>	17
<i>Euclidia glyphica</i> , Larva of	210
<i>Eupisteria heparata</i>	170
<i>Eupithecia expallidata</i>	82
<i>indigata</i>	257
<i>irriguata</i>	170
<i>pulchellata</i>	170
<i>subumbrata</i>	80
<i>Eupœcilia atricapitana</i> , Larva of	36
<i>ciliella</i> , "	37
<i>notulana</i> , "	37
<i>udana</i> , "	36
<i>Eurymene dolabraria</i>	169
<i>Euzophera polyxenella</i>	231
<i>Fidonia famula</i>	184
<i>Gelechia distinctella</i>	138
<i>spurcella</i>	247
<i>vilella</i>	246
<i>Gnophos asperaria</i> , ab. <i>pityata</i>	184
<i>repersaria</i>	184
<i>Gracilaria juglandella</i>	270
<i>Grapholitha nigricana</i> , Larva of	155
<i>roseticolana</i>	162
<i>sordicomana</i>	233
<i>Gymnancyla canella</i>	238
<i>Hadena adusta</i>	80, 258
<i>contigua</i>	171, 258
<i>Halia gesticularia</i>	184
<i>vincularia</i>	184
<i>Harpella bracteella</i>	237
<i>Staintoniella</i> ?	247
<i>Hecatera serena</i>	258
<i>Heliothis conferta</i>	8
<i>Hemerophila nycthemeraria</i>	184
<i>Hepialus velleda</i>	81, 257
<i>Herminia grisealis</i>	229
<i>Hesperia lineola</i>	183
<i>Hybernina aurantiaria</i>	257
<i>Hydrelia unca</i>	124, 125
<i>Hymenia fascialis</i>	9
<i>Hypena insignis</i>	9
<i>obsoleta</i>	9
<i>Lampronia luzella</i>	138
<i>Larentia salicata</i>	70, 257
<i>Laverna epilobiella</i>	137, 186
<i>miscella</i>	249
<i>Stephensi</i>	138
<i>Lecithocera luticornella</i>	246
<i>Leioptilus carphodactylus</i>	270
<i>Leucania dislocata</i>	7
<i>extranea</i>	7
<i>Limacodes asellus</i>	169

	xv. PAGE
<i>Lithocolletis adenocarpi</i>	249
<i>caudiferella</i>	249
<i>scopariella</i>	138
<i>Lithosia helvola</i>	169
<i>quadra</i>	169
<i>Lithostege grisearia</i>	124
<i>Lozopera eryngiana</i>	38
<i>flagellana</i>	38
<i>Francillana</i> , Larva of	38
<i>Lycæna Baton</i>	268
<i>Bætica</i>	182
<i>cyllarus</i>	268
<i>Damon</i>	268
<i>melanops</i>	182
<i>Telicanus</i>	182
<i>Lythria sanguinaria</i>	184
<i>Macaria alternata</i>	170
<i>Manistra pomerana</i>	45
<i>Melanargia Ines</i>	182
<i>Lachesis</i>	182
<i>Melanippe tristata</i>	257
<i>Melitæa aurinia</i> (<i>Artemis</i>), var. <i>Desfontaini</i>	182
<i>didyma</i> , var. <i>occidentalis</i>	182
<i>Phœbe</i> , var. <i>occitanica</i>	182
<i>Micra ostrina</i>	135
<i>parva</i>	135
<i>Micropteryx mansuetella</i>	246
<i>Nemophora pilella</i>	44
<i>Nemoria porrinata</i>	183
<i>Nemotois Latreillellus</i>	246
<i>Schiffermillerellus</i>	138
<i>Nepticula argyropeza</i>	137
<i>suberis</i>	249
<i>Noctua C-nigrum</i>	70, 139
<i>conflua</i>	258
<i>flammatra</i>	135
<i>glareosa</i>	258
<i>Nola cristulalis</i>	79, 80, 169
<i>Nonagria fulva</i> , Larva of	114
<i>Nothris limbipunctella</i> ?	247
<i>Notodonta dictæoides</i>	170
<i>Ocnogyna parasita</i>	270
<i>Œcophora augustella</i>	138
<i>detrimentella</i>	248
<i>Œgoconia quadripuncta</i>	248
<i>Œneis Aello</i>	268
<i>Olindia ulmana</i>	137
<i>Oporabia autumnaria</i>	257
<i>filigrammaria</i>	257
<i>Orgyia antiqua</i>	114, 133, 211
<i>Ornithoptera Brookeana</i>	237
<i>Tithonus</i>	237
<i>Urvilliana</i>	237

	PAGE
<i>Orthosia suspecta</i>	258
<i>Orthotænia antiquana</i>	81
<i>Oxyptilus obscurus</i>	270
<i>Pancalia Latreillella</i>	248
<i>Papilio Podalirius</i>	267
var. <i>Feisthamelii</i>	181
<i>Parasia castiliella</i>	247
<i>Pellonia sicanaria</i>	184
<i>Pempelia adelphella</i>	179
<i>hostilis</i> , Larva of	177, 237
<i>satureiella</i>	230
<i>Peronea (Teras) aspersana</i>	266
<i>hastiana</i> , Larva of	263
<i>logiana</i> , Larva of	262
<i>Lorquiniana</i>	267
<i>perplexana</i> (sp. n.), Barrett	265
<i>rufana</i> , Larva of	263
<i>Shepherdana</i>	266
<i>variegana</i> , „	264
<i>Phothedes captiuncula</i>	81, 82
<i>Pieris Callidice</i>	267
<i>Daplidice</i>	181
<i>Platypteryx lacertula</i>	80, 170
<i>Platyptilia isodactylus</i>	91
<i>Platytes cerussellus</i>	15
<i>Pleurota ericella</i>	247
<i>Plusia iota</i>	258
<i>pulchrina</i>	258
<i>verticillata</i>	8
<i>Plutella cruciferarum</i>	108
<i>polaris</i> (sp. n.), Zeller	109
<i>Polia chi</i>	258
<i>nigrocincta</i>	134
<i>Polyommatus Alciphron</i> , var. <i>Gordius</i> ..	181
<i>Dorilis</i> , var. <i>subalpina</i>	268
<i>Prodenia ingloria</i>	7
<i>Protoparce Blackburni</i> (sp. n.), Butler ..	6
<i>Pyralis ægusalis</i>	185
<i>Pyroderces argyrogrammos</i>	139
<i>Rhodaria sanguinalis</i>	81
<i>Rhodocera Cleopatra</i>	181
<i>Rivula sericealis</i>	82
<i>Schœnobia mucronellus</i>	17
<i>Scoparia altivolans</i> (sp. n.), Butler	9
<i>basistrigalis</i>	137
<i>Scopula decrepitalis</i>	148
<i>exigua</i> (sp. n.), Butler	9
<i>lutealis</i>	91
<i>Scotosia rara</i>	8
<i>undulata</i>	170
<i>Selenia illustraria</i>	169

	PAGE
<i>Sesia affinis</i>	183
<i>myopæformis</i>	70
<i>Setina aurita</i>	269
<i>Spælotis cremata</i> (sp. n.), Butler	8
<i>lucicolens</i> (sp. n.), Butler	7
<i>Spilodes sticticalis</i>	125
<i>Spilothyrus alceæ</i>	183
<i>Stauropus fagi</i>	18, 170
<i>Stenia fuscocillialis</i> (sp. n.), Ragonot	230
<i>Stephensia Brunnichella</i>	138
<i>Stigmonota scopariana</i>	35, 38, 70, 278
<i>Syrichthus alveus</i> , var. <i>onopordi</i>	183
<i>Proto</i>	183
<i>Sao</i> , var. <i>Eucrate</i>	183
<i>Tapinostola Bondi</i>	134
<i>Teleia tamariciella</i>	247
<i>Teras logiana</i> (<i>tristana</i>)	231, 262
<i>Tethea subtusa</i>	258
<i>Thais Rumina</i>	181
<i>Thecla ilicis</i> , var. <i>Esculi</i>	181
<i>roboris</i>	181
<i>spini</i>	181
<i>Threnodes pollinalis</i> , var. <i>guttulalis</i>	230
<i>Tinea caprimulgella</i>	138
<i>chrysopterella</i>	246
(<i>Blabophanes</i>) <i>imella</i>	246
(<i>Tineola</i>) <i>crassicornella</i>	246
<i>Tortrix amplana</i>	231
(<i>Lophoderus</i>) <i>Eatoniana</i> (sp. n.), Ragonot ..	231
<i>Toxocampa noctivolans</i> (sp. n.), Butler ...	8
<i>Triphæna pronuba</i> , Larva of	135
<i>subsequa</i>	211
<i>Vanessa Antiopa</i> .. 113, 126, 134, 137, 209, 268	
<i>cardui</i>	43, 169
<i>Xyliua furcifera</i> (<i>conformis</i>)	134
<i>Zelleria insignipennella</i>	116, 137
<i>Zonosoma pupillaria</i>	184
<i>Zygæna exulans</i>	269
<i>Minos</i> , var. <i>nubigena</i>	80, 81
<i>transalpina</i>	269

NEUROPTERA.

<i>Acrophylax zerberus</i>	219
<i>Adenophlebia</i> (g. n.), Eaton	194
<i>Æschna borealis</i>	141, 222
<i>Agrion Lindeni</i>	106
<i>Amphiaschna Irene</i>	105
<i>Ascalaphus baticus</i>	108
<i>Asynarchus cœnosus</i>	219
<i>Atalophlebia</i> (g. n.), Eaton	193
<i>Baëtis</i>	196

	PAGE
Blasturus (g. n.), Eaton	193
Cæcilius pedicularius.....	141
Callibætis (g. n.), Eaton	196
Choroterpes (g. n.) ,,	194
lusitanica (sp. n.), Eaton.....	194
Chrysopa clathrata, Pict.= lineolata, McL.	64
geniculata	62
granadensis	64
guadarramensis	63
italica	64
Meyeri	62
microcephala	62
monticola	64
nigro-punctata.....	62, 107
pallida.....	141
riparia.....	64
thoracica, Pict.= Picteti, McL.	63, 107
venosa.....	64
viridana	62
Zelleri	63
Clothilla picea	185
Coniopteryx lutea	21
Cordulia alpestris.....	141, 222
arctica.....	141, 222
metallica	141, 222
Cryptothrix nebulicola	220
Dictyopteryx alpina	221
Dilar Prestoni (sp. n.), McLach.	39
Drusus chrysotus	220
discolor	220
trifidus	220
Elassoneuria (g. n.), Eaton	191
Elipsocus cyanops	21, 71
Gomphus Graslini	105
Habrophlebia (g. n.), Eaton	195

	PAGE
Halesus hilaris	220
ruficollis	220
Homœoneuria (g. n.), Eaton.....	192
Salvinia (sp. n.), Eaton ...	192
Ischnura Graellsii	105
Jolia (g. n.), Eaton	192
Leptophlebia	193
Limnophilus despectus	219
Metanœa flavipennis	220
Molanna palpata	185
Myopsocus Eatoni (sp. n.), McLach.	103
Æcetis notata	91
Oligoneuria rhenana	163
Panorpa meridionalis.....	108
Phryganea obsoleta	219
Polycentropus Kingi (sp. n.), McLach. ...	254
Prosopistoma punctifrons.....	46, 117
Rhoënanthus (g. n.), Eaton	192
speciosus (sp. n.), Eaton ...	192
Rhyacophila glareosa.....	221
persimilis	220
proxima.....	221
stigmatica.....	221
Sialis nigripes, Pict.= fuliginosa, Pict....	62
Sisyra Dalii.....	106
Spaniophlebia (g. n.), Eaton	191
Trailiæ (sp. n.), Eaton ...	191
Sympetrum meridionale	222
Thraulius (g. n.), Eaton	195
bellus (sp. n.), Eaton	195

THYSANURA.

Degeeria pulchella (sp. n.), Ridley	270
Lipura aurantiaca ,,	1
Machilis brevicornis ,,	2

INDEX TO CONTRIBUTORS.

	PAGE
Adams, H. J.	113
Barrett, C. G.....	35, 82, 91, 186, 211, 262
Barrett, C. G., Jun.	69
Bates, H. W., F.L.S., &c.....	58, 275
Binnie, F. G.	91
Blackburn, Rev. T., B.A.....	85, 199, 226
Blatch, W. G.	117, 186, 208
Bloomfield, Rev. F. N., M.A.	165, 176, 258, 260
Brauer, Dr. F.....	186
Brunetti, E. A.	278
Buckler, W.....	18, 28, 42, 91, 114, 122, 156, 177, 249

	PAGE
Butler, A. G., F.L.S., &c.....	6, 110, 133
Butler, E. A.	67, 116, 234, 260
Cameron, P.	40, 66, 206, 271
Champion, G. C.....	212
Collett, E. P.....	165, 260, 278
Cottam, Arthur	163
Dale, C. W.	135, 207
Distant, W. L.....	222, 237, 245
Douglas, J. W.....	46, 70, 89, 114, 139, 142, 162, 164, 165, 172, 203
Downing, J. W.....	258
Eaton, Rev. A. E., M.A.	73, 94, 191, 238
Edwards, James	150, 224

	PAGE
Elliot, A.	139, 257
Ellis, John	113
Fabre, J. H.	100
Fernald, Prof. C. H.	95
Fletcher, J. E.	21, 180, 186, 212
Fletcher, W. H. B.	169
Fowler, Rev. W. W., M.A., F.L.S.	69, 140, 235
Fraser, Jane	57, 148
Garneys, W., M.R.C.S.	260
Gates, Rev. H. S. B.	186
Gill, Battershell, M.D.	135
Gorham, Rev. H. S.	162
Goss, H., F.L.S., &c.	134
Gray, Philip	186
Grigg, W. H.	121, 134
Hagen, Prof. H. A.	90
Hammond, O.	113
Hart, T. H.	141
Harwood, W. H.	237
Header, G. J., M.D.	134
Hodgkinson, J. B.	38, 44, 70, 278
Hodgson, A. E., B.A.	207
Jenner, J. H. A.,	134
Jordan, R. C. R., M.D.	113, 267
King, J. J.	185
Kirby, W. F.	85
Künow, —	89
Lewis George	159, 197, 198, 209, 255
Lindsay, C. L.	113
Logan, R. F.	237
McCaul, S.	113
McLachlan, R., F.R.S., &c.	21, 39, 46, 62, 71, 103, 117, 141, 145, 163, 185, 217, 254, 258
Meade, R. H.	22
Meyrick, E.	185
Müller, Dr. Fritz	225

	PAGE
Norman, George.	260
Osborne, J. A., M.D.	49, 127, 150
Osten-Sacken, Baron C. R.	130, 142, 161, 206
Parfitt, E.	94
Patton, W. H.	31
Porritt, G. T., F.L.S.	44, 91, 210
Pryer, W. B.	241
Ragonot, E. L.	15, 229
Renter, Dr. O. M.	10, 233
Ridley, H. N.	1, 2, 270
Sang, J.	237
Saunders, E., F.L.S.	3, 42, 68, 93, 97, 116, 165, 201
Saunders, F. S.	163
Saunders, W. J.	42
Savage, F. W.	162
Scott, John.	65, 132, 272, 278
Sharp, D., M.B.	69, 111
Stainton, H. T., F.R.S., &c.	45, 108, 135, 138, 246
Staudinger, Dr. O.	181
Steuart, A. E.	113
Swinton, A. H.	113, 134, 238
Thompson, Edith C.	113
Thompson, W.	256
Threlfall, J. H.	46
Walker, A.	113
Walker, J. J., R.N.	42, 79
Walsingham, Lord, M.A., F.Z.S., &c.	46, 93
Warren, W.	115, 116, 137
Westwood, Prof. J. O., M.A., F.L.S., &c.	189
Wilkinson, Rev. C.	43
Williams, Rev. H., M.A.	211
Wilson, T.	136
Wood, J. H., M.B.	155, 177
Wratislaw, Rev. A. H., M.A.	124
Zeller, Prof. P. C.	45

LIST OF NEW GENERA AND SPECIES, &c., DESCRIBED IN THIS VOLUME.

COLEOPTERA.

SPECIES.	PAGE
<i>Acanthoderes abstersus</i> , <i>H. W. Bates</i> , <i>N. Granada</i>	60
<i>carinicollis</i> , <i>H. W. Bates</i> , <i>Brazil</i>	61
<i>crocostigma</i> , „ <i>Ecuador</i>	61
<i>flexistigma</i> , „ <i>Pará</i>	61
<i>lætificus</i> , „ <i>Ecuador</i>	60
<i>leucodryas</i> , „ „	61
<i>longitarsis</i> , „ „	58
<i>luctuosus</i> , „ <i>Brazil</i>	60
<i>pupillatus</i> , „ <i>Venezuela, &c.</i>	60
<i>Acanthoderes satanas</i> , <i>H. W. Bates</i> , <i>Peru</i>	58
<i>subtessellatus</i> , <i>H. W. Bates</i> , <i>Ecuador</i>	59
<i>Thammi</i> , <i>H. W. Bates</i> , <i>Peru</i>	59
<i>vetustus</i> , „ <i>S. Brazil, &c.</i>	58
<i>zonatus</i> , „ <i>Granada</i>	59
<i>Anchomenus putealis</i> , <i>T. Blackburn</i> , <i>Hawaii</i>	227
<i>Anotheorus ignavus</i> , „ „	201
<i>Bembidium spureum</i> , „ „	228
<i>teres</i> , „ „	229
<i>Carneades nodicornis</i> , <i>H. W. Bates</i> , <i>Equador, &c.</i>	277

	PAGE
<i>Carneades personata</i> , <i>H. W. Bates</i> , <i>N. Granada</i>	277
<i>reticulata</i> , " "	277
<i>Cucujus coccinatus</i> , <i>Lewis</i> , <i>Japan</i>	198
<i>Cyclothorax lætus</i> , <i>T. Blackburn</i> , <i>Hawaii</i>	228
<i>robustus</i> , " "	228
<i>unctus</i> , " "	227
<i>Disenochus terebratus</i> " "	227
<i>Helota cereo-punctata</i> , <i>Lewis</i> , <i>Japan</i>	255
<i>Damaster capito</i> , " "	197
<i>viridipennis</i> , " "	161
<i>Oodemas infernum</i> , <i>T. Blackburn</i> , <i>Hawaii</i>	199
<i>Olindæ</i> , " "	199
<i>substrictum</i> , " "	200
<i>Smilicerus Belti</i> , <i>Sharp</i> , <i>Nicaragua</i>	111
<i>Sparna platyptera</i> , <i>H. W. Bates</i> , <i>Parana</i>	276
<i>Synchyzopus cancellatus</i> , " <i>Bolivia</i>	275
<i>duplex</i> , " <i>S. Brazil</i>	276
<i>lætus</i> , " <i>Ecuador</i>	275
<i>polystigma</i> , " <i>N. Granada</i>	276
<i>Tesserocerus Belti</i> , <i>Sharp</i> , <i>Nicaragua</i> ...	112

HEMIPTERA.

GENUS.

<i>ARACHNOCORIS</i> , <i>Scott</i>	272
--	-----

SPECIES.

<i>Apiomerus Oberthuri</i> , <i>Distant</i> , <i>S. America</i>	222
<i>Arachnocoris albomaculatus</i> , <i>Scott</i> , <i>Rio Janeiro</i>	273
<i>dispar</i> , <i>Scott</i> , <i>Para</i>	274
<i>Aspongopus nigroæneus</i> , <i>Reuter</i> , <i>Siam</i> ...	234
<i>Carbula amurensis</i> , " <i>Amuria</i>	233
<i>obtusangula</i> , " "	233
<i>Edessa fuscidorsata</i> , " <i>Mexico & Bogota</i>	234
<i>Globiceps salicicola</i> , <i>Reuter</i> , <i>Europe</i>	13
<i>Triquetra intermedia</i> , <i>Distant</i> , <i>Bogota</i> ...	223
<i>Typhlocyba Lethierryi</i> , <i>Edwards</i> , <i>England</i>	224

HYMENOPTERA.

SPECIES.

<i>Athalia scutellarizæ</i> , <i>Cameron</i> , <i>England</i> ..	66
<i>Crabro stygius</i> , <i>Kirby</i> , <i>Hawaiian Islands</i> ..	88
<i>Dolerus scoticus</i> , <i>Cameron</i> , <i>Scotland</i>	206
<i>Macropis ciliata</i> , <i>Patton</i> , <i>U. States</i>	31
<i>patellata</i> , " "	33
<i>Odynerus Blackburni</i> , <i>Kirby</i> , <i>Hawaiian Islands</i>	87
<i>extraneus</i> , <i>Kirby</i> , " "	86
<i>Prosopis flavifrons</i> , " "	85
<i>Torymus campanulæ</i> , <i>Cameron</i> , <i>Scotland</i> ..	40

LEPIDOPTERA.

PAGE

SPECIES.

<i>Brahmæa nigrans</i> , <i>Butler</i> , <i>Japan</i>	110
<i>Caradrina venosa</i> , " <i>Hawaii</i>	7
<i>Catoptria tripoliana</i> , <i>Barrett</i> , <i>England</i> ...	84
<i>Cochylis punctiferana</i> , <i>Ragonot</i> , <i>Portugal</i> ..	232
<i>Iolaus giganteus</i> , <i>Distant</i> , <i>Penang</i>	245
<i>Peronea perplexana</i> , <i>Barrett</i> , <i>Britain</i> ...	265
<i>Plutella polaris</i> , <i>Zeller</i> , <i>Spitzbergen</i>	109
<i>Protoparce Blackburni</i> , <i>Butler</i> , <i>Hawaii</i> ..	6
<i>Scoparia altivolans</i> , " "	9
<i>Scopula exigua</i> , " "	9
<i>Spælotis cremata</i> , " "	8
" <i>lucicolens</i> , " "	7
<i>Stenia fuscociliialis</i> , <i>Ragonot</i> , <i>Portugal</i> ...	230
<i>Tortrix Eatonia</i> , " "	231
<i>Toxocampa noctivolans</i> , <i>Butler</i> , <i>Hawaii</i> ..	8

NEUROPTERA.

GENERA.

<i>ADENOPHLEBIA</i> , <i>Eaton</i>	194
<i>ATALOPHLEBIA</i> , " "	193
<i>BLASTURUS</i> , " "	193
<i>CALLIBETIS</i> , " "	196
<i>CHOROTERPES</i> , " "	194
<i>ELASSONEURIA</i> , " "	191
<i>HABROPHLEBIA</i> , " "	195
<i>HOMÆONEURIA</i> , " "	192
<i>JOLIA</i> , " "	192
<i>RHOENANTHUS</i> , " "	192
<i>SPANIOPHLEBIA</i> , " "	191
<i>THRAULUS</i> , " "	195

SPECIES.

<i>Choroterpes lusitanica</i> , <i>Eaton</i> , <i>Portugal</i> ...	194
<i>Dilar Prestoni</i> , <i>McLach.</i> , <i>Rio Janeiro</i> ...	39
<i>Homæoneuria Salviniæ</i> , <i>Eaton</i> , <i>Guatemala</i> ..	192
<i>Myopsocus Eatoni</i> , <i>McLach.</i> , <i>Portugal</i> ...	103
<i>Polycentropus Kingi</i> , " <i>Scotland</i> ...	254
<i>Rhoenanthus speciosus</i> , <i>Eaton</i> , <i>Lahat</i> ...	192
<i>Spaniophlebia Traillæ</i> , " <i>Amazons</i> ..	191
<i>Thraulius bellus</i> , " <i>Portugal</i>	195

THYSANURA.

SPECIES.

<i>Degeeria pulchella</i> , <i>Ridley</i> , <i>England</i>	270
<i>Lipura aurantiaca</i> , " "	1
<i>Machilis brevicornis</i> , " "	2

ADDITIONS TO THE BRITISH INSECT FAUNA BROUGHT FORWARD IN THIS VOLUME.

DIPTERA.

	PAGE
<i>Morellia curvipes</i> , <i>Macq.</i>	27
<i>Sapromyza bipunctata</i> , <i>Meig.</i>	260

HEMIPTERA.

<i>Dicyphus stachydis</i> , <i>Reuter</i>	166, 234
<i>Globoiceps salicicola</i> (sp. n.), <i>Reuter</i>	13, 14
<i>Lygus atomarius</i> , <i>Meyer</i>	150
<i>Typhlocyba Lethierryi</i> (sp. n.), <i>Edwards</i>	224

HYMENOPTERA.

<i>Agrothereutes batavus</i> , <i>Voll.</i>	258
<i>Andrena lucens</i> , <i>Imh.</i>	99
<i>Athalia scutellariae</i> , <i>Cam.</i>	66
<i>Dolerus scoticus</i> , "	206
<i>Lissonota leucozona</i> , <i>Grav.</i>	258
<i>Mesolius rufilabris</i> , <i>Zett.</i>	236
<i>Pompilus minutulus</i> , <i>Dahlb.</i>	97
<i>Wesmaeli</i> , <i>Thoms.</i>	98
<i>Priocnemis parvulus</i> , <i>Dahlb.</i>	98
<i>pusillus</i> , "	99

LARVÆ OF BRITISH SPECIES DESCRIBED IN THIS VOLUME.

	PAGE
<i>Argyrolepis zephyrana</i> , <i>Barrett</i>	37
<i>Botrys pandalis</i> , <i>Buckler</i>	28, 156
<i>Catoptria tripoliana</i> , <i>Barrett</i>	84
<i>Chrysomela varians</i> , <i>Osborne</i>	151
<i>Crambus culmellus</i> , <i>Buckler</i>	91
<i>Drepana sicula</i> , "	122
<i>Ephestia ficulella</i> , <i>Porritt</i>	44
<i>Euclidia glyphica</i> , "	210
<i>Eupœcilia ciliella</i> , <i>Barrett</i>	37
<i>notulana</i> , "	37
<i>udana</i> , "	36
<i>Grapholitha nigricana</i> , <i>Wood</i>	155

	PAGE
<i>Torymus campanulæ</i> , <i>Cam.</i>	40
<i>caudatus</i> , <i>Boh.</i>	41
<i>juniperi</i> , <i>Linn.</i>	40
<i>sodalis</i> , <i>Mayr.</i>	40
<i>tipularum</i> , <i>Zett.</i>	40
<i>viridis</i> , <i>Först.</i>	40

LEPIDOPTERA.

<i>Asopia Lienigialis</i> , <i>Zell.</i>	256
<i>Bryophila par</i> , <i>Hüb.</i>	115
<i>Catoptria tripoliana</i> , <i>Barrett</i>	84
<i>Peronea perplexana</i> , <i>Barrett</i>	265
<i>Stigmonota scopariana</i> , <i>H.-S.</i>	38, 278

NEUROPTERA.

<i>Elipsocus cyanops</i> , <i>Rostock</i>	21
<i>Molanaa palpata</i> , <i>McLach.</i>	185
<i>Polycentropus Kingi</i> , <i>McLach.</i>	254

THYSANURA.

<i>Degeeria pulchella</i> , <i>Ridley</i>	270
<i>Lipura aurantiaca</i> , "	1
<i>Machilis brevicornis</i> , "	2

	PAGE
<i>Hydrocampa nymphæalis</i> , <i>Buckler</i>	249
<i>Lozopera Francillana</i> , <i>Barrett</i>	38
<i>Nonagria fulva</i> , <i>Buckler</i>	114
<i>Pempelia hostilis</i> , "	178
<i>Peronea aspersana</i> , <i>Barrett</i>	266
<i>hastiana</i> , "	263
<i>Logiana</i> , "	262
<i>Lorquiniana</i> , "	267
<i>perplexana</i> , "	265
<i>rufana</i> , "	263
<i>Shepherdana</i> , "	266
<i>variegana</i> , "	264

REVIEWS.

The Geological Antiquity of Insects: H. Goss	47
Illustrations of Typical specimens of Lepidoptera-Heterocera in the collection of the British Museum. Part IV—North American Tortricidæ: Lord Walsingham	93
Souvenirs Entomologiques: J. H. Fabre	117
Die Lepidopteren der Schweiz: H. Frey	118
Zoological Classification: F. P. Pascoe	119
Transactions of the Yorkshire Naturalists' Union	142
Insect Variety: A. H. Swinton	143
Monographie der deutschen Psociden: H. Kolbe	166
Avis préliminaire d'une nouvelle classification de Dytiscidæ: D. Sharp	157
The Young Naturalist	188
The Butterflies of North America: W. H. Edwards	189
A Treatise on Comparative Embryology: F. M. Balfour	238
Monograph of the British Aphides, Vol. iii: G. B. Buckton	279

OBITUARY.

	PAGE		PAGE
Professor Kirschbaum	47	Jacob Boll	213
Robert Hislop	71	Achille Guénée	214
Etienne Mulsant	189	Gabriel Koch	240

ERRATA.

- Page 137, line 15 from bottom, for "this month," read "September," to which the other dates in the same paragraph refer.
- " 219, line 2 from top, for "subjectus," read "despectus."
- " 235 " 18 " bottom, for "House," read "Home."
- " 236 " 14 " " for "brevicornis," read "lunicornis."

THE

ENTOMOLOGIST'S MONTHLY MAGAZINE:

CONDUCTED BY

C. G. BARRETT.

E. C. RYE, F.Z.S.

J. W. DOUGLAS.

E. SAUNDERS, F.L.S.

R. McLACHLAN, F.R.S

H. T. STANTON, F.R.S.

VOL. XVIII.

“Nature never hurries; atom by atom, little by little, she achieves her work.”

EMERSON.

248871

LONDON:

JOHN VAN VOORST, 1, PATERNOSTER ROW.

1881-82.

LONDON :

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXII.

	PAGE
British Pterophoridae, Notes on...	177
„ Tortrices, Notes on	152, 185
Butterflies from East Africa, On two new species	145
„ of the genus <i>Teracolus</i> , occurring at Acera, Gold Coast, On the...	227
Butterfly from the Malay Peninsula, Description of a new	134
Bythoscopidae Notes on the British	51
Caddis-fly, A Marine	278
<i>Cænis maxima</i> , Remarks on Dr. E. Joly's	71
<i>Callidryas Drya</i> , Boisdl., Life-History of	219
Capture of <i>Cassida vittata</i> near Hastings	214
„ „ <i>Ceratocombus</i> and <i>Cryptostemma</i>	113
„ „ rare Hymenoptera on the South Coast of England	160
„ „ „ Lepidoptera and Homoptera in Herefordshire	111
Captures of British Aculeate Hymenoptera, Notes on	262
„ „ Coleoptera in 1881	158
„ „ „ „ the Isle of Wight	70
„ „ Lepidoptera in the Norfolk fens	110
<i>Cassida vittata</i> near Hastings, Capture of	214
<i>Ceratocombus</i> and <i>Cryptostemma</i> , Capture of	113
<i>Cerura erminea</i> , A few words on the larva of, as distinguished from that of <i>C. vinula</i>	161
Cetoniidae from East Central Africa, New	156
<i>Charæas graminis</i> , Abundance of larvæ of	39, 68
„ „ in Thuringia, Ravages of the larvæ of	111
„ „ The influence of rain in the destruction of the larvæ of	86
<i>Charaxes</i> from West Africa, On a new species of	107
Chaudoir, Death of Baron de	20, 43
<i>Choragus Sheppardi</i> in Warwickshire	112
<i>Cicada montana</i>	40
Coccidæ, <i>Acanthococcus aceris</i> , Another apterous male in the	250
Cocoons of some of the silk-spinning Lepidoptera, On colouring matter, &c., of	260
<i>Coleophora adjunctella</i> , Hodgk., A new species of	189
„ <i>apicella</i> , A fruitless search for the larvæ of	141
Coleoptera at Chirique	158
„ „ Hastings, Rare	19, 40, 139
„ „ Margate	277
„ from New Zealand, Some new species and genera of	46
„ „ Further notes on Parthenogenesis in	128
„ in 1881, Captures of	158
„ „ Scotland, Rare	188
„ „ the Forest of Dean, Notes on the past season, and on the occurrence of certain Lepidoptera and	186
„ „ „ Isle of Wight, Captures of	70
„ near Lincoln, Early	277
„ of Askham Bog, York	7
„ „ the Hastings district, Notes on the	234
<i>Colias Edusa</i> in 1881, Scarcity of	210

	iii. PAGE
Collecting Coleoptera, &c., A new mode of	111
Colouring matter, &c., of cocoons of some of the silk-spinning Lepidoptera, On	260
Comparison of the Pterophori of Europe and North America, suggested by Lord Walsingham's "Pterophoridae of California and Oregon" ...	73, 117
Corticaria Wollastoni at Mablethorpe, &c.	261
Cosmia pyralina, near Weybridge	88
Crambus Warringtonellus, Natural History of	129
Cryptostemma, Capture of Ceratocombus and... ..	113
Cynipidæ, Alternation of generation in the	224
Darwin, Death of Charles Robert	278
"Degeeria," The generic term	19, 43
Deilephila spinifascia, Butler, Life-History of	131
Delphacidæ, On certain South American	154
Deltocephalus Flori, Fieb., in England	140
Description of a new butterfly from the Malay Peninsula	134
" " " " genus and species of Tenthredinidæ	107
" " " " species of Liburnia	270
" " " " " Saturniidæ from the Gold Coast	146
" " a Eudorea new to science (Eudorea conspicualis)	134
" " the larva of Ennychia octomaculalis	57
" " " " Hydroecia nictitans	195
" " " " Scoparia truncicolella	106
" " " " Scopula lutealis	147
Descriptions of some apparently new species of Arctiidæ from North America	135
Diasemia literalis in Pembrokeshire, Re-occurrence of	69
Dichrorhampha distinctana, Heinm., a Tortrix new to Britain	278
Dilar, A North American species of	55
Diptera in the New Forest, Rare	89
" of the Norfolk broads	149
Doleschall, Carl Ludwig, A brief notice of the Dipterologist	114
Drepana sicula	87, 108, 141, 233
Dufourea vulgaris, Schk., at Woking	161
Emmelesia blandiata, Natural History of	180
Ennychia octomaculalis, Description of the larva of	57
" " in Pembrokeshire	69
Entomological collecting on a voyage to the Pacific	81
" notes from Teneriffe, St. Vincent, &c.... ..	256
" Society of London, Proceedings of the 20, 72, 91, 116, 191, 216, 279	
Entomology of Portugal, Notes on the (Coleoptera)	230
" " " " " (Hymenoptera Aculeata)	165
Ephemeridæ, An announcement of new genera of the	21, 207
Epischnia (Anerastia) Farrella, A few words about	217
Eudorea new to science (E. conspicualis), Description of an... ..	134
Eulepia grammica	212
Eupithecia, A new species of (jasioneata)	80, 87
" consignata at Boxhill	39
" inturbata, Hüb., H.-S. (subciliata, Gn.), The larva of	142

	PAGE
Eupœcilia Musseliana and other Lepidoptera near Pembroke	70
Eustra, Notes on the genus, in Japan	39
Flight in beetles, Influence of size of elytra on	213
Fungi that attack insects, &c., Note on some	263
Garneys, Death of W.	144, 163
Gelechia brizella, Life-History of	56
„ scotinella, H.-S., in England, Occurrence of... .. .	143
Generation in the Cynipidæ, Alternation of	224
Giebel, Death of Professor C. G. A.	215
Gray, Death of John	190
Gymnancyla canella, &c., in East Sussex, Heliothis armiger	141
Gyrinus natator, Ichneumonidæ infesting larvæ of	88
Harpalus discoideus, F.	112
Heliothis armiger, Gymnancyla canella, &c., in East Sussex	141
Hemiptera, Additions to the Morayshire	18, 67
„ „ „ „ Perthshire	276
“ „ Argentina” by Carolus Berg: Review	90
„ at Battle, &c., Notes on	113
„ „ Hastings	140
„ -Homoptera, On certain British	65, 104, 137
„ of Finland	41
Hemiteles, A new species of	184
Hepialus humuli, Curious variety of	111
Himera pennaria, Note on the egg and some peculiarity of structure in the larva of	33
Homoptera in Herefordshire, Capture of rare Lepidoptera and	111
„ „, Rectifications concerning	275
Hydræcia nictitans, Description of the larva, &c., of	195
Hymenoptera at Hayling Island and Bournemouth, Aculeate	113
„ in 1881, Notes on spring	42
„ „, Notes on captures of British Aculeate	262
„ „, On five new British; with a synoptical table of the genus Sphecodes	197
„ „ on the South Coast of England, Capture of rare	160
Hypopus parasitic on ants	43
Ichneumonidæ infesting larvæ of Gyrinus natator	88
„ „, Two new species of	78, 251, 272
Influence of rain in the destruction of the larvæ of Charæas graminis	86
„ „ size of elytra on flight in beetles	213
„ „ volcanoes on flying Coleoptera, The	138
Information for Coleopterists	235
Insectarium at the Zoological Gardens	15
Japan, A note from	159
Larentia didymata bred from Anemone nemorosa	68
Larva of Cerura erminca, A few words on the, as distinguished from that of C. vinula	161
„ „ Ennychia octomaculalis, Description of the... .. .	57
„ „ Eupithecia inturbata, IIüb., H.-S. (subciliata, Gn.)... .. .	142

	V. PAGE
Larva of <i>Himera pennaria</i> , Note on the egg and some peculiarity of structure in the	33
„ „ <i>Hydræcia nictitans</i> , Description of the	195
„ „ <i>Scoparia truncicolella</i> , „ „ „ „	106
Larvæ of <i>Chæræas graminis</i> , Abundance of	39, 68
„ „ „ „ in Thuringia, Ravages of the	111
„ „ „ „ , The influence of rain in the destruction of the	86
„ „ <i>Coleophora apicella</i> , A fruitless search for the	141
„ „ <i>Gyrinus natator</i> , <i>Ichneumonidæ</i> infesting	88
„ „ <i>Scopula lutealis</i> and <i>S. prunalis</i>	189
<i>Lasiosomus enervis</i> , H.-S., near Weybridge	161
Leaf-mining larvæ extracted by birds (?)	143
<i>Lebia crux-minor</i> in Japan	188
Lepidoptera and Coleoptera in the Forest of Dean, Notes on the past season, and on the occurrence of certain	186
„ „ Homoptera in Herefordshire, Capture of rare	111
„ at Barnwell Wold	38
„ „ Deal, Rare	87
„ in Roxburghshire, in 1881, Notes on	209
„ „ the Norfolk fens, Captures of	110
„ near Pembroke, <i>Eupæcilia Mussehliana</i> and other	70
„ observed in the neighbourhood of Gallipoli, Turkey in 1878, List of	10, 29, 92
„ of West Norfolk, Notes on the	239
“Les Cynipides, 1 ^{re} partie, par Dr. H. Adler, de Schleswig, traduit et annoté par J. Lichtenstein :” Review	215
<i>Liburnia</i> , Description of a new species of	270
Life-History of <i>Callidryas Drya</i> , Boisd	219
„ „ „ <i>Deilephila spinifascia</i> , Butler	131
„ „ „ <i>Gelechia brizella</i>	56
<i>Limnophilus subcentralis</i> , Brauer, in Scotland	72
Lincoln, Early Coleoptera near	277
List of British Anthomyiidæ, Annotated 1, 27, 62, 101, 123, 172, 201, 221, 265	
„ „ Lepidoptera observed in the neighbourhood of Gallipoli, Turkey in 1878	10, 29, 92
Marine Caddis-fly, A	278
Measurements in descriptive Entomology ; a suggestion	205, 236, 237
<i>Meligethes morosus</i> , Er., a species new to Britain	112
<i>Meloë variegata</i> and other Coleoptera at Margate	277
<i>Miana expolita</i> , Natural History of	76
<i>Micralymma brevipenne</i> , Note on	140
“Micrographic Dictionary, The, Fourth Edition, edited by J. W. Griffith, M.D., assisted by Rev. J. M. Berkeley and T. Rupert Jones :” Review	72
Micro-Lepidoptera, Notes on	16
<i>Mimæseoptilus Hodgkinsoni</i> versus <i>Loewii</i>	212
Morayshire Hemiptera, Additions to the	18, 67
Moults in larvæ from the same batch of eggs, On the variable number of	86
Muscular power of <i>Rhagium inquisitor</i>	18

	PAGE
Natural History of <i>Crambus Warringtonellus</i>	129
„ „ „ <i>Emmelesia blandiata</i>	180
„ „ „ <i>Miana expolita</i>	76
„ „ „ <i>Papilio Machaon</i> , Some points in the	244
<i>Nepticula agrimoniae</i> , Heyden, a species new to Britain	211
„ <i>sericopeza</i> near Cambridge, Occurrence of	142
<i>Neurorthus</i> (Costa, 1863) = <i>Sartena</i> (Hagen, 1864)	89, 140
New <i>Cetoniidae</i> from East Central Africa	156
„ genera of the <i>Ephemeridae</i> , An announcement of	21, 207
„ locality for <i>Polycentropus Kingi</i> , McLach.	163
„ mode of collecting <i>Coleoptera</i> , &c.	111
„ species and genera of <i>Colcoptera</i> from New Zealand, Some	46
„ „ of <i>Coleophora</i> (<i>C. adjunctella</i> , Hodgk.)	189
„ „ „ <i>Eupithecia</i> (<i>jasioneata</i>)	80, 87
„ „ „ <i>Ichneumonidae</i> , Two	78, 251
„ <i>Zealand Journal of Science</i>	238
<i>Nonagria despecta</i> in Pembrokeshire	109
North American species of <i>Dilar</i>	55
„ <i>Middlesex Natural History Association</i>	216
Notes, More tropical	214
„ on British <i>Tortrices</i>	152, 185
„ „ „ <i>Pterophoridae</i>	177
„ „ captures of British <i>Aculeate Hymenoptera</i>	262
„ „ <i>Hemiptera</i> at Battle, &c.	113
„ „ <i>Lepidoptera</i> in Roxburghshire in 1881	209
„ „ <i>Micro-Lepidoptera</i>	16
„ „ spring <i>Hymenoptera</i> in 1881... ..	42
„ „ <i>Tenthredinidae</i>	126, 193, 271
„ „ the British <i>Bythoscopidae</i>	51
„ „ „ <i>Coleoptera</i> of the Hastings district	234
„ „ „ Entomology of Portugal (<i>Coleoptera</i>)	230
„ „ „ „ „ (Hymenoptera <i>Aculeata</i>)	165
„ „ „ genus <i>Eustra</i> in Japan	39
„ „ „ <i>Lepidoptera</i> of West Norfolk	239
„ „ „ past season, and on the occurrence of certain <i>Lepidoptera</i> and <i>Coleoptera</i> in the Forest of Dean	186
„ „ „ species of <i>Ophthalmophora</i> , a genus of <i>Geometrid</i> moths ..	59
„ „ <i>Thysanura</i> collected in the Canaries and Madeira	14
<i>Notodonta cucullina</i>	88
„ <i>dictæa</i> double-brooded, <i>Smerinthus populi</i> and	211
Occurrence of <i>Æcetis furva</i> , Ramb., in Cumberland	163
„ „ <i>Gelechia scotinella</i> , H.-S., in England	143
„ „ <i>Nepticula sericopeza</i> near Cambridge	142
<i>Æcetis furva</i> , Ramb., in Cumberland, Occurrence of	163
<i>Ophthalmophora</i> , Notes on the species of, a genus of <i>Geometrid</i> moths ...	59
<i>Oporabia</i> , The genus	87
<i>Oryctes nasicornis</i> at Wick	262
<i>Oxytelus fulvipes</i> in Warwickshire	213

	vii.
	PAGE
Panorpidæ from Western North America, On two new	36
"Papilio; devoted to Lepidoptera exclusively. Organ of the New York Entomological Club;" Review	20
Papilio Machaon, Some points in the Natural History of	244
Parthenogenesis in Coleoptera, Further notes on	128
" " Tenthredinidæ, On	127
Peculiarity of structure in the larvæ of <i>Himera pennaria</i> , Note on the egg and some	33
Perthshire Hemiptera, Additions to the	276
<i>Phytosus balticus</i> , &c., at Mablethorpe	158
<i>Pieris napi</i> , Singular variety of	110
<i>Platyptilia dichrodactyla</i> and <i>Bertrami</i>	143
<i>Plusia orichalcea</i> in Pembrokeshire	109
<i>Polycentropus Kingi</i> , McLach., New locality for	163
<i>Polystichus vittatus</i> , at St. Leonard's, Re-occurrence of	235
Portugal, Entomology of	165, 230
Proceedings of the Entomological Society of London 20, 72, 91, 116, 191, 216, 279	
" " " " Perthshire Society of Natural Science. Vol. I, part 1:"	
Review	238
<i>Psylla buxi</i> , Note on the earlier states of	18
Psyllidæ not yet known as British, Note on <i>Trioza erithmi</i> , F. Löw, a species of	263
Psyllina, with corrections in the synonymy, British	253
Pterophori of Europe and North America, A comparison of the, suggested by Lord Walsingham's "Pterophoridæ of California and Oregon" ... 73, 117	
Pterophoridæ, Notes on British	177
<i>Pterostichus vulgaris</i> , &c., in a frog's stomach	188
<i>Ptinella denticollis</i> , Abundance of	276
Putzeys, Death of Jules	215
Rain, The influence of, in the destruction of the larvæ of <i>Charæas graminis</i>	86
Rare Coleoptera at Hastings	19, 40, 139
" " in Scotland	188
" Diptera in the New Forest	89
" Lepidoptera at Deal	87
Ravages of the larvæ of <i>Charæas graminis</i> in Thuringia	111
Rectifications concerning Homoptera	275
Re-discovery of <i>Anerastia Farrella</i>	211, 219
Remarks on Dr. Joly's <i>Cænis maxima</i>	71
Re-occurrence of <i>Diasemia literalis</i> in Pembrokeshire	69
" " <i>Polystichus vittatus</i> at St. Leonard's	235
" " <i>Trochilium scoliiforme</i> at Llangollen	162
"Report of the Entomologist of the United States Department of Agricul- ture for the Year 1880, by J. H. Comstock:" Review	263
<i>Revue Coleoptérologique</i>	190
<i>Rhagium inquisitor</i> , The muscular power of	18
<i>Rivista Scientifico-Industriale e Giornale del Naturalista</i>	216
<i>Sartena</i> (Hagen, 1864) = <i>Neurorthus</i> (Costa, 1863)	89, 140
Saturniidæ from the Gold Coast, Description of a new species of	146
Searcity of <i>Colias Edusa</i> in 1881	210

	PAGE
Scoparia truncicolella, Description of the larva of	106
Scopula lutealis and S. prunalis, Larvæ of	189
„ „, Description of the larva of	147
Sericomyia borealis "singing" while at rest	159, 189, 190
Setodes argentipunctella, McLach.	163
Smerinthus populi and Notodonta dictæa double-brooded	211
Société Française d'Entomologie	163
Sphecodes, On five new British Hymenoptera; with a synoptical table of the genus	197
Stenophylax rotundipennis, Brauer, in Scotland	163
Tenthredinidæ, Description of a new genus and species of	107
„ „, Notes on	126, 193, 271
„ „, On Parthenogenesis in	127
Tephrosia crepuscularia and biundularia, Results of experiments in rearing	274
Teracolus occurring at Acera, Gold Coast, On the Butterflies of the genus...	227
"The Butterflies of Europe, by H. C. Lang, M.D., F.L.S.:" Review ...	91
Thecla w-album, Unusual abundance of	68
Thomson, Death of Sir Charles Wyville, LL.D., F.R.S.	264
Thyreophora antipodum; new species of Diptera	35
Thysanoptera, A request for European	235
Thysanura collected in the Canaries and Madeira, Notes on ..	14
Tortrices, Notes on British	152, 185
Tortricidæ, Dichrorhampha distinctana, a species of, new to Britain ...	278
Tortrix Lafauriana, Ragonot, a species new to Britian ..	17, 260
"Transactions of the Norfolk and Norwich Naturalist's Society. Vol. 3, part 2:" Review	90
Trioxa crithmii, F. Löw, Note on, a species of Psyllidæ not yet known as British	263, 276
Trochilium scoliiforme at Llangollen, Re-occurrence of	162
Tropical notes, More	214
Vanessa Antiopa at Llandaff	18
Variety of Argynnis Paphia, Curious	188
„ „ Hepialus humuli, „	111
„ „ Pieris napi, Singular	110
Vespa germanica, Fab., Early appearance of	234
Volcanoes, The influence of, on flying Coleoptera	138
Wiener entomologische Zeitung	163
Winters in Japan, On the supposed effect of the, on the smaller Coleoptera	5

INDEX OF SUBJECTS NOTICED IN THE PROCEEDINGS OF THE ENTOMOLOGICAL SOCIETY OF LONDON.

	PAGE
Adephaga, Dr. Horne's classification of.	279
Æpophilus Bonnairei exhibited	192
Aleurodes carpini exhibited	72
Amazons, Lepidoptera from the	92
Anniversary Meeting	216
Antheræa macrophthalma exhibited	191
Aphis granaria preyed upon by Allotria	92

Argas persicus in Turkestan, Notes on	72
Australia, Rhynchota from	72
Bombyliidæ parasitic on Locusts	91, 117, 192
Bombyx mori, Abnormal pupa of	116
Borneo, New species of Cicadidæ from	192
Brachycerus?, Larvæ of, destructive to lilies	192
Butterflies, Female pupæ of, attractive to males	280
„ in papers, Imprints of	280
Caddis-flies, Collection of British, exhibited	280
Callistus lunatus captured in quantity	279
Cecidomyia foliorum on Artemisia vulgaris	116
Cecidomyiidæ, New species of, on flowers of Galium mollugo	116
Cereals, Diptera destructive to, in Britain	192
Cerura vinula and erminea, Differences in the larvæ of	192
Ceylon, New insect of doubtful order from	191
Charæas graminis, Damage caused by larva of	91, 117
Chili, Lepidoptera of	117, 192, 280
Cicadidæ, New species of	192
Coccinella, Variation in	280
Coleoptera from India, New Myrmecophilous species of	280
„ „ New Zealand, New species of	280
„ „ Sumatra, New	117
„ „ the Hawaiian Islands, New	191
„ „ New Longicorn	92
Coreidæ and Pentatomidæ, New neotropical	92
Crabro clavipes exhibited	72
Diptera destructive to cereals in Britain	192
Dolerus, Larvæ of, causing damage to grass	91
Drosophila cellaris destructive to pickles	116
Dufourea vulgaris from Woking	192
Dyscoletes, A new genus of Hymenoptera.. .. .	92
Ecuador, New Rutelidæ from.. .. .	191
„ Papilionidæ from	92
Encyrtidæ, Species of, parasitic on Zeugera æsculi	116
Ennomos tiliaria, Variety of	192
Euchroma, Species of	92
Eumolpidæ, New	117
Euthyplocia, Nymph of	116
Fig insects, Remarks on	192, 279
Fiji, Damage to cocoa-nut trees by Lopaphus in.. .. .	191
Formica umbrata, var. mixta, Occurrence in Britain of	191
Gastrophysa raphani, Parthenogenesis in	191
Halticella csmicida, Sexes of	279
„ „ Terminal segments of	280
Harpalus cupreus in the Isle of Wight	192
„ discoideus, British specimen of	191
Hawaiian Islands, Lepidoptera from	279
„ „ New Coleoptera from the	191
Heliconius Charitonia, Sexual instinct in	280

	PAGE
Honey-comb built against a wall	192
Hymenoptera, Mounting and preservation of	191, 280
" New species of	191
Iceland, Porcellio scaber from	192
Ichneumon erythræus captured in quantity	280
Ichneumonidæ, New or rare British	117
Iodis vernaria, Oviposition of	92
Japan, Heterocerous Lepidoptera from	20, 92, 192
Lepidoptera from Chili	47, 192
" " the Amazons	92
" " " Hawaiian Islands	279
" " " Heterocerous, from Japan	20
Lepidopterous larvæ forming cases of dog's excrement	192
Lilies, Larva of Brachycerus (?) destructive to	192
Locusts, Report of Committee on parasite of	91, 117, 192
Longicorn Coleoptera, New	92
Lopaphus coccophagus damaging cocoa-nut trees in Fiji	191
Lycæna Icarus, var. Icaroides, exhibited	192
Macromela Balyi exhibited	279
Molorehus minor exhibited	72
Morpho Adonis, Female of	91
Myrmeleonidæ, Larva of, from Zante, found living in England	192
New Zealand, Coleoptera from	280
Notiophilus biguttatus, Abnormal	191
Nycteribia, Larva of	92
Oestridæ, Species of, parasitic on a mouse	117
Orchestes damaging elm	91
Orthezia, The genus.. .. .	72, 92
Ourapteryx sambucaria, Variety of	191
Papilio americanus with abnormal neuration	191
" Cenæa, Stoll., The sexes of, taken <i>in copulâ</i>	20
Papilionidæ from Ecuador	92
Parthenogenesis in Gastrophysa raphani	191
Pentatomidæ and Coreidæ, New neotropical	92
Phora rufipes parasitic on Nematus ribesii	192
Phylloxera in Victoria, Report of Committee respecting	20, 72
Porcellio scaber from Iceland	192
Prosopis, Terminal segments of	280
Rhopalocera from South Africa, New	92
Rhynchota from Australia	72
Rutelidæ from Ecuador, New	191
Scenopinus fenestralis bred from aconite	192
Scleroderma, Notes on	192
South Africa, New Rhopalocera from	92
" " Tineidæ, Tortricidæ, and Pterophoridæ of	72
Strenia clathrata, Variety of	279
Sumatra, New Coleoptera from	117
Telephorus lituratus, Variety of	192
Tinea vastella (gigantella) feeding on a horse's hoof	20
Tortricidæ, Tineidæ, and Pterophoridæ of South Africa	72
Trichoptera, Collection of British, exhibited	280
Vespa germanica hibernating socially	279
Vice-Presidents.. .. .	279

SPECIAL INDEX.

COLEOPTERA.

	PAGE		PAGE
<i>Acidota crenata</i>	188	<i>Homalota princeps</i>	70
<i>Aëpus marinus</i>	71	<i>Hydaticus transversalis</i>	9
<i>Agathidium rhinoceros</i>	188	<i>Hydnobius strigosus</i>	188
<i>Aleochara cuniculorum</i>	234	<i>Hydræna palustris</i>	9
<i>Amara Quenseli</i>	188	<i>Hydroporus decoratus</i>	8
<i>Anchomenus Helmsi</i> (sp. n.), Sharp	47	<i>oblongus</i>	8
<i>Anthophagus alpinus</i>	188	<i>rufifrons</i>	8
<i>Anthribus albinus</i>	40	<i>Scalesianus</i>	8
<i>Aphodius porcus</i>	158	<i>Hypselogenia corrossa</i> (sp.n.), H. W. Bates	156
<i>Zenkeri</i>	158	<i>Ilyobates nigricollis</i>	234
<i>Athous difformis</i>	19, 139	<i>Lamia textor</i>	113
<i>Atomaria atra</i>	234	<i>Lebia crux-minor</i> in Japan	188
<i>Bembidium 5-striatum</i>	278	<i>Limnobius picinus</i>	9
<i>Cænopsis fissirostris</i>	19, 40	<i>Lissotes Helmsi</i> (sp. n.), Sharp	49
<i>Calosoma inquisitor</i>	187	<i>Meligethes morosus</i>	112
<i>Carabus Steuerti</i>	230	<i>viduatus</i>	158
<i>Cassida nobilis</i>	278	<i>Meloë variegata</i>	277
<i>vittata</i>	214	<i>Micralymma brevipenne</i>	140
<i>Ceratorrhina Burkei</i> , var. <i>histrio</i> , H. W. Bates	157	<i>Miscodera arctica</i>	188
<i>Euthalia</i> (sp. n.), ,,	156	<i>Mordella fasciata</i>	113
<i>princeps</i> ,, ,,	156	<i>Necrophilus prolongatus</i> (sp. n.), Sharp	47
<i>Ceuthorhynchideus Chevrolati</i>	18	<i>Notiophilus 4-punctatus</i>	40
<i>Chlænienus gallæcianus</i>	231	<i>Ocypus fuscatus</i>	278
<i>Choragus Sheppardi</i>	112	<i>Ocyusa picina</i>	213
<i>Chrosis violacea</i> (sp. n.), Sharp	49	<i>Oryctes nasicornis</i> in Britain	262
<i>Cicindela campestris</i> , var. <i>maroccana</i>	230	<i>Oxytelus fulvipes</i>	213
<i>Corticaria curta</i>	262	<i>Philonthus discoideus</i>	234
<i>fulvipes</i>	262	<i>thermarum</i>	234
<i>transversalis</i>	261	<i>Phytosus balticus</i>	158
<i>Wollastoni</i>	261	<i>spinifer</i>	158
<i>Demetrias monostigma</i>	158	<i>Plæsiorrhina undulata</i> (sp. n.), H. W. Bates	157
<i>Dromius 4-signatus</i>	277	<i>Platyrhinus latirostris</i>	112
<i>Eccoptocnemis relucens</i> (sp. n.), H. W. Bates	157	<i>Polystichus vittatus</i>	235
<i>Eustra plagiata</i>	39	<i>Protelater nigricans</i> (sp. n.), Sharp	50
<i>Gastrophysa raphani</i> , Parthenogenesis in	128	<i>Pselaphus dresdensis</i>	9
<i>Gymnusa variegata</i>	213	<i>Ptenidium formicetorum</i>	234
<i>Gyrinus natator</i> , Parasites on	88	<i>Pterostichus vulgaris</i> in frog's stomach ..	188
<i>Halipilus obliquus</i>	8	<i>Prinella denticollis</i>	276
<i>Haplocnemus nigricornis</i>	113	<i>Quedius auricomus</i>	113
<i>Harpalus discoideus</i>	112	<i>Rhagium inquisitor</i>	18
<i>4-punctatus</i>	188	<i>Rhynchites cupreus</i>	139
<i>servus</i>	19	<i>Scaphodius compactus</i> (sp. n.), Sharp	50
<i>Heterorrhina elongata</i> (sp.n.), H. W. Bates	157	<i>Stenus Guynemeri</i>	113
<i>lævicauda</i> , ,, ,,	157	<i>Tachinus pallipes</i>	188
<i>tricolor</i> , ,, ,,	157	<i>proximus</i>	188
		<i>Tachyusa coarctata</i>	40
		<i>Trechus lapidosus</i>	71
		<i>Trichopteryx picicornis</i>	234
		<i>Zeatyus Lawsoni</i> (sp. n.), Sharp	48

DIPTERA.

Anthomyiidae, British.....	1, 27, 62, 101, 123, 172, 201, 221
Ascia flavalis	151
Azelia	221
aterrima	223
gibbera	223
Calliphora grœnlandica	152
Chrysogaster splendida	151
Cœlomyia	223
mollissima	224
Ctenophora ornata	89
Drymeia	172
hamata.....	172
Graphomyia picta	151
Gymnopternus assimilis	151
chalybeus	150
Henops gibbosus	89
Homalomyia	201
aprica	202
armata	203
circularis	202
carbonaria	205
floricola	205
fuscula	202
herniosa	204
incisurata	202
manicata	203
mutica	204
pallitibia	202
scalaris	202
serena	204
sociella	204
spissata (sp. n.), Meade	203
Hydrophoria	102
ambigua	102
anthomyia	103
brunneifrons	103
caudata	103
divisa	102
socia	104
Hydrophorus bipunctatus.....	151
viridis	151
Hydrotæa	123
armipes	124
cyrtoneurina	123
dentipes	124
fasciculata (sp. n.), Meade	125
irritans	124
meteorica	124
palæstrica	124
Rondanii (sp. n.), Meade.....	125

	PAGE
Hyetodesia	2
dispar	3
dubia (sp. n.), Meade.....	4
serva	3
scutellaris	3
vagus	3
Hylemyia	265
antiqua	268
cardui	267
cinerella	268
cinerosa	268
coarctata	269
flavipennis	266
hilaris	266
lasciva	266
nigrescens	268
nigrimana	269
operosa	269
præpotens	269
puella	269
pullula	268
seticrura.....	267
strigosa	269
tibiaris	270
variata	266
virginea	266
Limnophora	101
compuncta	101
contractifrons	101
septemnotata.....	102
triangulifera	101
Morellia curvipes	152
Mydæa	27
allotalla	28
angelicæ.....	28
flaveola	28
nigritella	27
separata	28
urbana	28
Ophyra.....	173
Piezura.....	221
pardalina	221
Platychirus fulviventris	151
Pogonomyia	172
alpicola	172
Poliates	2
Sericomyia borealis.....	159, 189, 190
Spilogaster	62
communis	64
consimilis	65
depuncta	65
duplaris	63
duplicata	63
flagipes.....	65
fuscata	65

	PAGE
<i>Spilogaster maculosa</i>	62
<i>notata</i>	62
<i>quadrimaculata</i>	63
<i>quadrum</i>	64
<i>Trichophthicus</i>	173
<i>cunctans</i>	174
<i>pulcher</i> (sp. n.), Meade ...	175
<i>rostratus</i> „ „ ...	176
<i>semipellucidus</i>	175
<i>Thyreophorus antipodum</i> (sp. n.), Osten-Sacken...	35

HEMIPTERA.

<i>Acanthococcus aceris</i> , ♂ apterous	250
<i>Acocephalus polystolus</i>	276
<i>Acompocoris alpinus</i>	113
<i>Aëpophilus Bonnairei</i>	145
<i>Agalliasites Wilkinsoni</i> , macropterous ...	276
<i>Anoterops setulosus</i>	113
<i>Aphalara artemisiæ</i>	254
<i>calthæ</i>	254
<i>exilis</i>	254
<i>nebulosa</i>	254, 275
<i>nervosa</i>	18, 254
<i>picta</i>	254, 276
<i>Arytæna genistæ</i>	255
<i>Athysanus piceus</i>	276
<i>russeolus</i>	276
<i>Bergia nimbata</i>	155
<i>Cerataphis lataniæ</i>	275
<i>Ceratocombus coleoptratus</i>	113
<i>Chilacis typhæ</i>	113
<i>Cicada montana</i>	140
<i>Coccidæ</i> , American	263
<i>Corizus maculatus</i>	140
<i>Corixa carinata</i>	276
<i>Cryptostemma aliena</i>	113
<i>Deltocephalus distinguendus</i>	67
<i>Flori</i>	66, 140
<i>I-album</i> (sp. n.), Scott.....	137
<i>Normani</i> „ „	105
<i>picturatus</i>	276
<i>repletus</i>	66
<i>Dicranotropis hamata</i> , macropterous	276
<i>Doratura stylata</i> , macropterous	276
<i>Euides fuscovittata</i> (sp. n.), Scott	155
<i>Gastrodes abietis</i>	18
<i>Gerris aspera</i>	18
<i>Gossyparia ulmi</i> , ♂ apterous	250
<i>Idiocerus fulgidus</i>	53
<i>varius</i>	52
<i>Lasiosomus enervis</i>	161

	xiii. PAGE
<i>Liburnia Bergi</i> = <i>L. cognata</i> , Berg.	156
<i>discolor</i> , macropterous	276
<i>insignis</i> (sp. n.), Scott	270, 076
<i>mesomela</i> , macropterous	276
<i>v-flava</i> (sp. n.), Scott.....	104
<i>Livia juncorum</i>	254
<i>Livilla ulicis</i>	255
<i>Myrmedobia tenella</i>	276
<i>Orthezia cataphracta</i> , ♂ developed	276
<i>floccosa</i>	276
<i>Orthotylus fuscescens</i>	276
<i>Pediopsis fuscinervis</i>	54
<i>nassatus</i>	54
<i>Podisus luridus</i>	113
<i>Pæciloscytus Gyllenhali</i> , macropterous ...	276
<i>Psylla alni</i>	255
<i>betulæ</i>	255
<i>buxi</i>	18, 255
<i>costalis</i>	254
<i>costatopunctata</i>	254
<i>cratægi</i>	255
<i>Försteri</i>	255
<i>Hartigi</i>	255
<i>hippophæis</i>	255
<i>Loewi</i>	255
<i>mali</i>	254
<i>peregrina</i>	254
<i>pineti</i>	255
<i>pruni</i>	254
<i>pyricola</i>	254
<i>pyrisuga</i>	254
<i>ramnicola</i>	255
<i>salicicola</i>	255
<i>simulans</i>	254
<i>spartii</i>	255
<i>stenolabis</i>	255
<i>visci</i>	111, 255
<i>Psyllopsis fraxini</i>	254
<i>fraxinicola</i>	254
<i>Rhinocola aceris</i>	254
<i>ericæ</i>	254
<i>Ritsemia pupifera</i> , ♂ apterous.....	250
<i>Sehirus biguttatus</i>	40, 140
<i>luctuosus</i>	41
<i>Tetrura rubi</i>	275
<i>Trichopsylla Walkeri</i>	255
<i>Trioza abdominalis</i>	255, 276
<i>acutipennis</i>	255
<i>albiventris</i>	255
<i>crithmi</i>	263, 276
<i>Dalei</i>	255
<i>galii</i>	255, 276

	PAGE
<i>Trioza munda</i>	255
<i>remota</i>	255
<i>rhamni</i>	255
<i>salicivora</i>	255
<i>urticæ</i>	255
<i>viridula</i>	255
<i>Zicrona cærulea</i>	113

HYMENOPTERA.

<i>Agenia variegata</i>	262
<i>Andrena austriaca</i>	114, 262
<i>decorata</i>	114
<i>erythronota</i>	167
<i>extricata</i>	42
<i>fasciata</i>	42
<i>granulosa</i>	167
<i>Hattorfiana</i>	262
<i>lapponica</i>	42
<i>lithurgoides</i>	167
<i>nigriceps</i>	114
<i>obsoleta</i>	167
<i>Pandellæi</i>	167
<i>puncticollis</i>	167
<i>simillima</i>	262
<i>tridentata</i>	114
<i>Anthophora femorata</i>	171
<i>Thomsoni</i> (sp. n.), E. Saunders	171
<i>Aporus bicolor</i> ..	262
<i>Astata stigma</i>	113
<i>Blennocampa sulcata</i> (sp. n.), Cameron ..	271
<i>Bombus cullumanus</i>	161
<i>Schrimshiranus</i>	114
<i>soroensis</i>	160, 262
<i>Camptopoeum frontale</i>	169
<i>Ceramius lusitanicus</i> ..	166
<i>Colletes marginata</i>	166
<i>pici stigma</i>	161, 199
<i>Cræsus Varus</i>	127
<i>Dasygaster cingulata</i>	167
<i>Eatoni</i> (sp. n.), E. Saunders ..	168
<i>Dineura Degeeri</i>	127
<i>Dioxys pyrenaica</i>	170
<i>Dufourea vulgaris</i>	161
<i>Epeolus productus</i>	114, 200
<i>Eucera collaris</i>	170
<i>hispanica</i>	170
<i>semistrigosa</i>	170
<i>Fenusa hortulana</i>	127
<i>Fornica sanguinea</i>	262
<i>Halictus bifasciatus</i>	166
<i>brevicornis</i>	199

	PAGE
<i>Halictus costulatus</i>	166
<i>platycestus</i>	166
<i>quadricinctus</i>	160
<i>Hemichroa alni</i>	126
<i>rufa</i>	127
<i>Hemiteles gyrini</i> (sp. n.), Parfitt	79, 88
<i>litoreus</i> " "	272
<i>persector</i> " "	185
<i>Heptamelus ochroleucus</i>	272
<i>Hoplusis latifrons</i>	165
<i>Limneria affinis</i> (sp. n.), Parfitt	252
<i>Mesoleius brachyacanthus</i> (sp. n.), Parfitt ..	78
<i>elegans</i> " "	273
<i>Mutilla europæa</i>	114
<i>Nematus Bergmanni</i>	193
<i>croceus</i>	127
<i>curtispina</i>	125
<i>glutinosæ</i> (sp. n.), Cameron	193
<i>lacteus</i>	195
<i>miliaris</i>	194
<i>palliatu</i>	195
<i>salicis</i>	127
<i>salicivorus</i> (sp. n.), Cameron ..	194
<i>Neuroterus lenticularis</i>	225
<i>Odynerus basalis</i>	262
<i>Dufouri</i>	165
<i>Osmia pilicornis</i>	262
<i>Oxybelus mandibularis</i>	114
<i>mucronatus</i>	114
<i>Panurginus montanus</i>	169
<i>Panurgus Perezi</i> (sp. n.), E. Saunders ..	169
<i>proximus</i> " "	168
<i>Parastatis indica</i> (g. et sp. n.), Kirby ..	107
<i>Phyllotoma ochropoda</i>	127
<i>Polyblastus Bridgmani</i> (sp. n.), Parfitt ..	251
<i>Prosopis dilatata</i>	114
<i>Pterochilus phaleratus</i>	166
<i>Spathogaster baccarum</i>	225
<i>Sphecodes</i> , British species of	198
<i>ephippium</i>	198
<i>gibbus</i>	198
<i>pilifrons</i>	198
<i>puncticeps</i>	198
<i>rufiventris</i>	198
<i>similis</i>	198
<i>subquadratus</i>	198
<i>Stelis phæoptera</i>	262
<i>Strongylogaster macula</i>	272
<i>viridis</i>	272
<i>Tenthredo scotica</i> (sp. n.), Cameron	193
<i>Trichiosoma vitellinæ</i>	127
<i>Vespa germanica</i>	234

LEPIDOPTERA.

	PAGE
<i>Acentropus niveus</i>	17
<i>Acherontia Atropos</i>	96, 260
<i>Acidalia emutaria</i>	241
<i>immutata</i>	109, 240
<i>straminata</i>	68
<i>Acontia lucida</i>	99
<i>Agdistis tamaricis</i> ?	259
<i>Agraulis moneta</i>	85
<i>vanillæ</i>	85
<i>Agrophila sulphuralis</i>	13, 99
<i>Agrotis Ashworthi</i>	162
<i>fennica</i>	82
<i>sauca</i>	243
<i>Amblyptilia acanthodactyla</i>	117, 212
<i>cosmodactyla</i>	117, 177, 213
<i>pica</i>	117
<i>punctidactyla</i>	117, 212
<i>Amphidasis betularia</i>	61
<i>prodromaria</i>	239
<i>Anartia jatrophæ</i>	85
<i>Anerastia Farrella</i>	211, 217, 219
<i>Anisopteryx æscularia</i>	34, 210
<i>Antheræa macrophthalmus</i> (sp. n.), Kirby	146
<i>Anthocharis Belia</i>	31
<i>Apamea fibrosa</i>	110
<i>Aplecta herbida</i>	39, 209
<i>Aporia cratægi</i>	30
<i>Arctia Dodgei</i> (sp. n.), Butler	134
<i>Hebe</i>	98
<i>ochreatea</i> (sp. n.), Butler	134
<i>purpurata</i>	98
<i>rhoda</i> (sp. n.), Butler.....	134
<i>Argyrophorus argenteus</i>	83
<i>Argynnis Daphne</i>	94
<i>Lathonia</i>	94
<i>Pandora</i>	12, 94
<i>Paphia</i>	94, 188
<i>Asthenia scopariana</i>	278
<i>Boletobia fuliginaria</i>	68, 108, 109
<i>Botys lancealis</i>	38, 240
<i>sanguinalis</i>	13, 100
<i>Brachytænia Woodiana</i> (sp. n.), Barrett...	185
<i>Brephos Parthenias</i>	239
<i>Callidryas Drya</i> , Larva of.....	219
<i>Statira</i>	85
<i>Callimorpha Hera</i>	98
<i>Catocala conjuncta</i>	99
<i>conversa</i>	99
<i>hymenæa</i>	99
<i>Catoptria candidulana</i> (Wimmerana).....	141
<i>Cekæna Haworthi</i>	110

	PAGE
<i>Cerostoma asperella</i>	111
<i>Cerura erminea</i> , Larva of	161
<i>furcula</i>	209
<i>vinula</i>	34, 161
<i>Cethosia Logani</i> (sp. n.), Distant.....	134
<i>Chærocampa celerio</i>	258
<i>elpenor</i>	38
<i>Charæas graminis</i>	39, 68, 86, 111
<i>Charaxes Carteri</i> (sp. n.), Butler	108
<i>cedreatis</i>	108
<i>Kirkii</i> (sp. n.), Butler	145
<i>Cheimatobia boreata</i>	211
<i>Chortobius Davus</i>	68
<i>Chrysocorys erythriella</i>	73
<i>felicella</i>	73
<i>festaliella</i>	73
<i>Cledeobia moldavica</i>	100
<i>Coleophora adjunctella</i> (sp. n.), Hodgkinson	189
<i>apicella</i>	141
<i>olivaceella</i>	16
<i>Colias Edusa</i>	31, 210
<i>Lesbia</i>	82
<i>Vautieri</i>	82, 83
<i>Collix sparsata</i>	110, 240
<i>Coremia quadrifasciaria</i>	241
<i>Corycia taminata</i> ..	240
<i>temerata</i>	38
<i>Cosmia pyralina</i>	88
<i>Crambus margaritellus</i>	68
<i>paludellus</i>	110
<i>Warringtonellus</i> , Larva of	129
<i>Cymatophora flavicornis</i>	239
<i>ocularis</i>	241
<i>Danaïs Archippus</i>	82, 85
<i>Chrysippus</i> , var. <i>Alcippus</i>	81
<i>Deilephila Alecto</i> , Larva of	97
<i>euphorbiæ</i>	96
<i>livornica</i>	96
<i>spinifascia</i> , Larva of	131
<i>Deiopeia pulchella</i>	81, 98
<i>Depressaria cnicella</i>	141
<i>Diasemia literalis</i>	69
<i>Dichrorhampha distinctana</i>	278
<i>Drepana sicula</i>	87, 108, 141, 233
<i>Elachista apicipunctella</i>	210
<i>humilis</i>	16
<i>perplexella</i>	16
<i>Emmelesia blandiata</i> , Larva of	180
<i>Emydia striata</i>	98
<i>Ennomos alniaria</i>	87
<i>Ennychia octomaculalis</i>	69
, Larva of	57

	PAGE		PAGE
Epischnia (Anerastia) Farrella.....	217	Lycæna semiargus	92
Lafauyrella	217, 218	Telicanus	32
Erastria fuscula	240	Lythria purpuraria	100
Euchromia ericetana	110, 242	Macroglossa croatica, Larva of.....	97
Eudorea conspicualis (sp. n.), Hodgkinson	134	stellatarum	97
pallida	109	Margarodes unionalis	100
Eulepia grammica	212	Melanargia Larissa	12, 13, 94
Eupithecia consignata	39	Melitæa Artemis	70
inturbata, Larva of	142	Cinxia	93
jacioneata (sp. n.), Crewe	80, 87	didyma	94
, Larva of	80	Phœbe	93
linariata	241	trivia	13
subciliata, Larva of	142	, Larva of	93
Eupœcilia ambiguella	152	Miana expolita	76
Geyeriana	110	Mimæseoptilus aridus	179
Manniana	242	bipunctidactylus.....	178
Musschliana	70	Hodgkinsoni	212
pallidana	242	Loewii	180, 212
udana	241	plagiodyctylus.....	178
Eurycreon sticticalis	100	serotinus	178
Gelechia brizella, Larva of	56	zophodactylus	180
malvella	219	Nemeobius Lucina	38
scotinella.....	143	Nepticula agrimonie.....	211
Grammodes algira	99	sericopeza	142
bifasciata	99	Nisoniades Marloyi	96
Gymnancyla canella	141	Nola centonalis	87
Hadena rectilinea	209	cristulalis	38
Heliothis armiger	12, 81, 99, 141, 258	Nonagria brevilinea	110
Hepialus humuli	111	despecta	109, 240
velleda, var. carnus	210	neurica	110
Hesperia Actæon	96	Notodonta cucullina	88
nostrodomus	96	dictæa	211
Thaumas.....	96	dictæoides	110, 209
Himera pennaria	210	Nudaria senex	110
, Larva of	33, 38	Oporabia autumnaria	210
Hydrœcia nictitans, Larva of	195	dilutata	87, 88
Hypenodes costestrigalis	242	filigrammaria	88
Hyria auroraria	68	Ophthalmophora bella (sp. n.), Butler	60
Ino ampelophaga	98	Lucilla	60
Junonia Lavinia	85	Orobena frumentalis	100
Larentia didymata	68	Orthosia suspecta	242
Lasionmata Xiphia	257	Orthotania ericetana	110, 242
Leiocampa dictæoides.....	110, 209	Oxyptilus distans	178
Leucania congrua	99	hieracii	177
phragmitidis	242	letus	178
pudorina	110	obscurus	177
straminea	110	punctidactylus	177
unipuncta	81	Papilio Archidamas	83
Leucanitis stolidia	99	Machaon	29, 110
Limenitis Camilla	92	, Larva of	244
Lithosia caniola	98	Podalirius	28
griseola	110	Pararge Mæra	95
muscerda	110	Roxelana	12, 95
stramineola	110	Pellonia calabraria	100
Lobesia reliquana	239	Peronea Lorquiniana	110
Lozotænia latiorana	260	Phlæodes Demarniana	241
Lycæna Admetus	32	Phorodesma neriararia	100
Ananda	32	Pieris Daphidice	30
Argiades	32	, Larva of	31
batica	32	napi	110
Bavius	32	Pionea stramentalis	242
Cyllarus	92	Platyptilia Bertrami	74, 75, 143, 177
Pylaon	32	Bischoffi	74

	PAGE
<i>Platyptilia cardui</i>	74
<i>cervinidactyla</i>	74, 75
<i>dichrodactyla</i>	75, 143, 177
<i>gonodactyla</i>	177
<i>modestus</i>	74
<i>ochrodactyla</i>	177
<i>orthocarpi</i>	74
<i>trigonodactyla</i>	177
<i>Plodia interpunctella</i>	241
<i>Plusia orichalcea</i>	109
<i>Plutella Dalella</i>	210
<i>Pœcilocampa populi</i>	38
<i>Polyommatus Alciphron</i>	32
<i>Phlœas</i>	32
<i>v. Eleus</i>	32
<i>Thersamon</i>	32
<i>Polyphœnis sericata</i>	99
<i>Psyche calvella</i>	17
<i>opacella</i>	17
<i>Pyrameis Carye</i>	82, 83, 85
<i>Huntera</i>	82
<i>Rhodocera Cleopatra</i>	31
<i>Rivula sericealis</i>	240
<i>Saturnia pyri</i>	99
<i>Satyris Briseis</i>	94
<i>Hermione</i>	94
<i>Statilinus, var. Allionia</i>	95
<i>Schœnobius mucronellus</i>	110
<i>Schraukia turfosalis</i>	242
<i>Scoparia truncicollis, Larva of</i>	106
<i>Scopula lutealis, " "</i>	147, 189
<i>prunalis, " "</i>	189
<i>Scotosia undulata</i>	240
<i>Semasia populana</i>	243
<i>Simyra venosa</i>	110
<i>Smerinthus populi</i>	97, 209, 211
<i>Sphinx convolvuli</i>	96, 209, 243
<i>Spilosoma urticae</i>	110
<i>Spilothyrus alceae, Larva of</i>	95
<i>althaeae</i>	96
<i>Spintherops spectrum</i>	99
<i>Sterrhia sacaria</i>	100
<i>Stigmonota internana</i>	240
<i>perlepidana</i>	240
<i>Syrichthus orbifer</i>	96
<i>Sao</i>	96
<i>serratulæ</i>	96
<i>sidae</i>	96
<i>Tœniocampa rubricosa</i>	239
<i>Tephrosia biundularia</i>	274
<i>crepuscularia</i>	274
<i>Teracolus Antigone</i>	228
<i>Arethusa</i>	228
<i>Carteri (sp. n.), Butler</i>	227
<i>coniger " "</i>	229
<i>incretus " "</i>	146
<i>minans " "</i>	229
<i>Ocale</i>	228
<i>Phlegetonia</i>	230
<i>Tethea retusa</i>	110
<i>subtusa</i>	242
<i>Thais Cerisyi</i>	13
<i>, Larva of</i>	29

	PAGE
<i>Thalera fimbrialis</i>	100
<i>Thalpocharis ostrina</i>	99
<i>parva</i>	99
<i>Thecla betulæ</i>	38
<i>ilicis</i>	31
<i>pruni</i>	38
<i>w-album</i>	68
<i>Tinea argentimaculella</i>	16, 17
<i>Trichiura cratægi</i>	38
<i>Triphæna subsequa</i>	209, 210
<i>Tortrix Lafauriana</i>	17, 242, 260
<i>Trochilium scoliiforme</i>	162
<i>Vanessa Atalanta</i>	93
<i>Antiopa</i>	18, 93
<i>c-album</i>	93
<i>cardui</i>	93
<i>polychloros</i>	93
<i>Venusia cambrica</i>	210
<i>Xylophasia scolopacina</i>	240
<i>Zygæna læta</i>	98
<i>pilosellæ (Minos)</i>	98
<i>punctum</i>	98
<i>sedi</i>	98

NEUROPTERA.

<i>Anax ephippiger</i>	258
<i>Atopopus (g. n.) Eaton</i>	22
<i>Calliarcys " "</i>	21
<i>Chironetes " "</i>	21
<i>Componeuria " "</i>	23
<i>Bittacus chlorostigma (sp. n.), McLach</i>	36
<i>Cænis maxima</i>	71
<i>Dilar americanus (sp. n.), McLach</i>	55
<i>Ecdyurus</i>	25
<i>Epeorus (g. n.), Eaton</i>	26
<i>torrentium (sp. n.), Eaton</i>	26
<i>Hagenulus (g. n.), Eaton</i>	207
<i>caligatus</i>	207
<i>Leptohyphes (g. n.), Eaton</i>	208
<i>eximius (sp. n.), Eaton</i>	208
<i>Limnophilus subcentralis</i>	72
<i>Mucropalpus fallax</i>	89, 140
<i>Neurorthus iridipennis</i>	89, 140
<i>Ecetis furva</i>	163
<i>Pægniodes (g. n.) Eaton</i>	23
<i>Panorpodes oregonensis (sp. n.), McLach</i>	37
<i>paradoxa</i>	37
<i>Polycentropus Kingi</i>	163
<i>Rhithrogenia (g. n.) Eaton</i>	23
<i>Sartena amœna</i>	89, 140
<i>Setodes argentipunctella</i>	163
<i>Stenophylax rotundipennis</i>	163
<i>Teloganodes (g. n.), Eaton</i>	208
<i>Thalerosphyrus " "</i>	22

THYSANURA.

<i>Degeeria = Entomobrya</i>	19, 43
<i>Lepisma Eatoni (sp. n.), Ridley</i>	14
<i>mauritanica</i>	14

INDEX TO CONTRIBUTORS.

	PAGE		PAGE
Atmore, E. A.	17, 211, 239	Llewelyn, J. T. D., M.A., F.L.S.	274
Axou, W. E. A.	87	McLachlan, R., F.R.S., &c.	36, 43, 55, 89, 205, 237, 278
Barrett, C. G.	69, 70, 88, 109, 110, 111, 152, 177, 185, 188, 233, 260, 278	Malpas, J.	109
Bates, H. W., F.R.S., &c.	156, 230	Mann, W. K.	141
Billups, T. R.	161, 234	Mathew, G. F., R.N., F.L.S., &c.	29, 92, 131, 210, 211, 256
Blatch, W. G.	112, 113, 140, 213, 276	Meade, R. H.	1, 19, 27, 62, 101, 123, 177, 201, 221, 265
Bloomfield, Rev. E. N., M.A.	141, 159	Meek, E. G.	87, 219
Bodemeyer-Heinrichau, E. von	111	Moncreaff, H.	56
Buckler, W.	17, 57, 76, 87, 129, 147, 180, 195, 244	Norman, G.	18, 67, 276
Burton, F. M.	61	Ollivant, J. E.	18
Butler, A. G., F.L.S., &c.	107, 135, 145, 227	Osborne, J. A., M.D.	128
Butler, E. A.	40, 113, 235	Osten-Sacken, Baron C. R.	35, 114
Cameron, P.	193, 271	Parfitt, E.	43, 78, 184, 251, 272
Champion, G. C.	214	Pasley, T. E. S.	88
Collett, E. P.	19, 139, 140, 234	Pergande, T.	235
Collett, H. F.	139	Piffard, B.	40, 68
Crewe, Rev. H. Harpur, M.A.	80	Pim, H. B.	112
Dale, C. W.	89, 111	Porritt, G. T., F.L.S.	38, 68, 106, 182, 189
Distant, W. L., V.-P.E.S.	134	Ridley, H. N., M.A.	14
Douglas, J. W.	41, 140, 236	Rothney, G. A. J.	262
Dunbar, L. D.	260, 262	Sang, J.	143
Eaton, Rev. A. E., M.A.	21, 71, 207	Saunders, E., F.L.S.	42, 113, 165, 197
Edwards, J.	51	Saunders, Sir S. S., C.M.G.	160
Elliot, A.	209	Savage, F. W.	214
Fletcher, J. E.	126, 127, 143	Scott, J.	18, 65, 104, 137, 154, 253, 263, 270, 275, 276
Fletcher, W. H. B.	211	Sharp, D., M.B.	46, 159, 230
Forbes, W. A., M.A., F.L.S.	15	Smith, F. W.	108, 109
Fowler, Rev. W. W., M.A., F.L.S.	7, 18, 70, 112, 158, 188, 261, 277	Smith, W. G., F.L.S.	263
Grigg, W. H.	87, 108	Speyer, Dr. A.	142
Gutheil, A.	111	Stainton, H. T., F.R.S., &c.	141, 161, 217
Hagen, Prof. H. A.	140	Swinton, A. H.	189
Hellins, Rev. J., M.A.	33, 86, 88, 190, 260	Threlfall, J. H.	16
Hodgkinson, J. B.	134, 189, 212	Tugwell, W. H.	87
Hodgson, A. E., B.A.	186, 188	Verrall, G. H.	149
Inchbald, P., F.L.S.	68	Walker, J. J., R.N.	81
Jones, A. H.	39	Warren, W.	142
Jordan, R. C. R., M.D.	73, 117	Waterhouse, C. O.	145
Kenrick, G. H.	162	Wellman, J. R.	68, 109
King, J. J.	72, 163	Williams, Rev. H., M.A.	212
Kirby, W. F.	107, 146	Wood, Th.	158, 277
Lewis, G.	39, 138, 188, 213		
Lichtenstein, J.	224, 250, 275		

LIST OF NEW GENERA AND SPECIES, &c., DESCRIBED
IN THIS VOLUME.

	PAGE		PAGE
COLEOPTERA.			
GENUS.	PAGE	Heterorhina elongata, H. W. Bates,	
ZEATYRUS, Sharp	48	E. Africa	157
SPECIES.		levicauda, " "	157
Auchomenus Helmsi, Sharp, N. Zealand	47	tricolor, " "	157
Ceratorhina Burkei, var. histrio,		Hypsogenia corrosa, " "	156
H. W. Bates, E. Africa	157	Lissotes Helmsi, Sharp, N. Zealand	49
Euthalia, " "	156	Necrophilus prolongatus, Sharp,	
princeps, " "	156	N. Zealand	47
Chloris violacea, Sharp, N. Zealand	49	Plasiiorhina undulata, H. W. Bates,	
Eccoptycnemis relucens, H. W. Bates,		E. Africa	157
E. Africa	157	Protelater nigricans, Sharp, N. Zealand..	50
		Scaphodius compactus " "	50
		Zeatyryns Lawsoni, " "	48

DIPTERA.

SPECIES.	PAGE
<i>Homalomyia spissata</i> , <i>Meade, England</i> ..	203
<i>Hydrotæa fasciculata</i> , " " ..	125
<i>Rondanii</i> , " " ..	125
<i>Hyetodesia dubia</i> , " " ..	4
<i>Thyreophora antipodum</i> , <i>Osten-Sacken</i> , <i>Tasmania</i> ..	35
<i>Trichophthicus pulcher</i> , <i>Meade, England</i> ..	175
<i>rostratus</i> , " " ..	176

HEMIPTERA.

GENUS.	
<i>BERGIA</i> , <i>Scott</i> ..	155
<i>CERATAPHIS</i> , <i>Licht.</i> ..	275
<i>TETREBA</i> , " ..	275

SPECIES.

<i>Deltocephalus l-album</i> , <i>Scott, England</i> ..	137
<i>Normani</i> , " <i>Scotland</i> ..	105
<i>Euides fuscovittata</i> , <i>Scott, Buenos Ayres</i> ..	155
<i>Liburnia insignis</i> , " <i>Scotland</i> ..	270
<i>v-flava</i> , " <i>England</i> ..	104

HYMENOPTERA.

GENUS.

<i>PARASTATIS</i> , <i>Kirby</i> ..	107
-------------------------------------	-----

SPECIES.

<i>Anthophora Thomsoni</i> , <i>E. Saunders</i> , <i>Portugal</i> ..	171
<i>Blennocampa</i> (<i>Monophadnus</i>) <i>sulcata</i> , <i>Cameron, Scotland</i> ..	271
<i>Dasypoda Eatoni</i> , <i>E. Saunders, Portugal</i> ..	168
<i>Hemiteles gyrini</i> , <i>Parfitt, England</i> ..	79
<i>litoreus</i> , " " ..	272
<i>persector</i> , " " ..	185
<i>Limneria affinis</i> , " " ..	252
<i>Mespleius brachyacanthus</i> , <i>Parfitt</i> , <i>England</i> ..	78
<i>elegans</i> , <i>Parfitt, England</i> ..	273
<i>Nematus glutinosæ</i> , <i>Cameron, Scotland</i> ..	193
<i>salicivorus</i> , " " ..	194
<i>Panurgus Perezi</i> , <i>E. Saunders, Portugal</i> ..	169
<i>proximus</i> , " " ..	168
<i>Parastatis indica</i> , <i>Kirby, India</i> ..	107
<i>Polyblastus Bridgmani</i> , <i>Parfitt, England</i> ..	251
<i>Tenthredo scotica</i> , <i>Cameron, Scotland</i> ..	193

LEPIDOPTERA.

SPECIES.

<i>Antheræa macrophthalmus</i> , <i>W. F. Kirby</i> , <i>Gold Coast</i> ..	146
<i>Arctia Dodgei</i> , <i>Butler, N. America</i> ..	136
<i>ochreatea</i> , " <i>United States</i> ..	136
<i>rhoda</i> , " " ..	136
<i>Brachytania Woodiana</i> , <i>Barrett</i> , <i>England</i> ..	185
<i>Cethosia Logani</i> , <i>Distant</i> , <i>Prov. Wellesley</i> ..	134
<i>Charaxes Carteri</i> , <i>Butler, Accra</i> ..	108
<i>Kirkii</i> , " <i>Mamboa</i> ..	145
<i>Eudorea conspicualis</i> , <i>Hodgkinson</i> , <i>England</i> ..	134
<i>Eupithecia jasionæata</i> , <i>Crewe</i> , " ..	80
<i>Ophthalmophora bella</i> , <i>Butler, Limas</i> ..	60
<i>Lucilla</i> , " <i>R. Janeiro</i> ..	60
<i>Teracolus Carteri</i> , " <i>Accra</i> ..	227
<i>coniger</i> , " " ..	229
<i>incretus</i> , " <i>Mamboa</i> ..	146
<i>minans</i> , " <i>Accra</i> ..	229

NEUROPTERA.

GENERA.

<i>ATOPOPUS</i> , <i>Eaton</i> ..	22
<i>CALLIARCYS</i> , " ..	21
<i>CHIROTONETES</i> , <i>Eaton</i> ..	21
<i>COMPONEURIA</i> , " ..	23
<i>EPEORUS</i> , " ..	26
<i>HAGENULUS</i> , " ..	207
<i>LEPTOHYPHES</i> , " ..	208
<i>PEGNIODES</i> , " ..	23
<i>RHITHROGENIA</i> , " ..	23
<i>THELOGANODES</i> , " ..	208
<i>THALEROSOPHYRUS</i> , " ..	22

SPECIES.

<i>Atopopus tarsalis</i> , <i>Eaton, Labuan</i> ..	22
<i>Bittacus chlorostigma</i> , <i>McLachlan</i> , <i>S. California</i> ..	36
<i>Calliarcys humilis</i> , <i>Eaton, Portugal</i> ..	21
<i>Componeuria spectabilis</i> , <i>Eaton, Lahat</i> ..	23
<i>Dilar americanus</i> , <i>McLachlan, Kentucky</i> ..	55
<i>Epeorus torrentium</i> , <i>Eaton, S. France</i> ..	26
<i>Hagenulus caligatus</i> , " <i>Cuba</i> ..	207
<i>Leptohyphes eximius</i> , " <i>Cordova</i> ..	208
<i>Panorpodes oregonensis</i> , <i>McLachlan</i> , <i>Oregon</i> ..	37

THYSANURA.

SPECIES.

<i>Lepisma Eatoni</i> , <i>Ridley, Canary Islands</i> ..	14
--	----

ADDITIONS TO THE BRITISH INSECT FAUNA BROUGHT FORWARD IN THIS VOLUME.

COLEOPTERA.

	PAGE
<i>Meligethes morosus</i> , <i>Er.</i> ..	112

DIPTERA.

<i>Azelia Macquarti</i> , <i>Stäg.</i> ..	222
<i>Zetterstedti</i> , <i>Rond.</i> ..	223
<i>Gymnopternus chalybeus</i> , <i>Wiedm.</i> ..	150
<i>Homalomyia carbonaria</i> , <i>Rond.</i> ..	205
<i>herniosa</i> , " ..	204
<i>mutica</i> , <i>Zett.</i> ..	204
<i>pallitibia</i> , <i>Rond.</i> ..	202
<i>serena</i> , <i>Fall.</i> ..	204
<i>sociella</i> , <i>Zett.</i> ..	201
<i>spissata</i> (sp. n.), <i>Meade</i> ..	203

PAGE

<i>Hydrophoria ambigua</i> , <i>Fall.</i> ..	102
<i>anthomyia</i> , <i>Rond.</i> ..	103
<i>brunneifrons</i> , <i>Zett.</i> ..	103
<i>caudata</i> , " ..	103
<i>linogrisea</i> , <i>Meig.</i> ..	102
<i>socia</i> , <i>Fall.</i> ..	102
<i>Hydrotæa cyrtoneurina</i> , <i>Zett.</i> ..	123
<i>fasciculata</i> (sp. n.), <i>Meade</i> ..	125
<i>Rondanii</i> , " " ..	125
<i>Hyetodesia basalis</i> , <i>Zett.</i> ..	2
<i>dubia</i> (sp. n.), <i>Meade</i> ..	4
<i>lasiophthalma</i> , <i>Macq.</i> ..	2
<i>lata</i> , <i>Fall.</i> ..	2
<i>longipes</i> , <i>Zett.</i> ..	2

	PAGE
<i>Hyetodesia marinorata</i> , Zett.	2
<i>rufipaplis</i> , Macq.	2
<i>variabilis</i> , Fall.	2
<i>Hylemyia cinerosa</i> , Zett.	278
<i>lasciva</i> , "	266
<i>nigrescens</i> , Rond.	268
<i>operosa</i> , Meig	269
<i>puella</i> , "	268
<i>seticrura</i> , Rond.	267
<i>Limnophora contractifrons</i> , Zett.	101
<i>septemnotata</i> , "	102
<i>sororcula</i> , "	101
<i>triangulifera</i> , "	101
<i>Mydæa allotalla</i> , Meig.	28
<i>flavcola</i> , Fall.	28
<i>nigricolor</i> , "	27
<i>nigritella</i> , Zett.	27
<i>tineta</i> , "	27
<i>Piezura pardalina</i> , Rond.	221
<i>Pogonomyia alpicola</i> , Rond.	172
<i>Spilogaster communis</i> , Desv.	64
<i>consimilis</i> , Fall.	65
<i>duplaris</i> , Zett.	63
<i>duplicata</i> , Meig.	63
<i>flagipes</i> , Rond.	65
<i>fuscata</i> , Fall.	65
<i>nigrinervis</i> , Zett.	62
<i>Trichophthicus pulcher</i> (sp. n.), Meade .	175
<i>rostratus</i> , "	176
<i>semipellucidus</i> , Zett.	175

HEMIPTERA.

<i>Aëpophilus Bonnairei</i> , Sign.	145
<i>Athysanus russeolus</i> , Fall.	276
<i>Deltocephalus distinguendus</i> , Flor	67
<i>Flori</i> , Fieb.	66, 140
<i>l-album</i> , Scott	137

	PAGE
<i>Deltocephalus Normani</i> , Scott	105
<i>picturatus</i> , Fieb.	276
<i>repletus</i> , "	66
<i>Idiocerus varius</i> , Fab.	53
<i>Liburnia insignis</i> , (sp. n.), Scott	270
<i>v-flava</i> , Scott	104
<i>Trioza crithmi</i> , F. Löw	276

HYMENOPTERA.

<i>Blennocampa sulcata</i> , Cameron	271
<i>Colletes picistigma</i> , Thoms.	199
<i>Epeolus productus</i> , "	200
<i>Halictus brevicornis</i> , Schenck	199
<i>Hemiteles gyriini</i> (sp. n.), Parfitt	79
<i>litoreus</i> , " "	272
<i>persector</i> , " "	185
<i>Limneria affinis</i> , " "	252
<i>Mesoleius brachyacanthus</i> (sp. n.), Parfitt	78
<i>elegans</i> , "	273
<i>Nematus glutinosæ</i> (sp. n.), Cameron ..	193
<i>salicivorus</i> , "	194
<i>Polyblastus Bridgmani</i> (sp. n.), Parfitt ..	251
<i>Sphecodes puncticeps</i> , Thoms.	198
<i>similis</i> , Wesm.	198
<i>Strongylogaster macula</i> , Klug.	272
<i>Tenthredo scotica</i> (sp. n.), Cameron	193

LEPIDOPTERA.

<i>Brachytania Woodiana</i> (sp. n.), Barrett.	185
<i>Coleophora adjunctella</i> , " Hodgk.	189
<i>Dichrorampha distinctana</i> , Hein.	278
<i>Eudorea conspiciualis</i> (sp. n.), Hodgk.	134
<i>Eupithecia jasioncata</i> , " Creve	80
<i>Gelechia scotinella</i> , H.-S.	143
<i>Nepticula agrimonie</i> , Hey'en	211
<i>Tortrix Lafauriana</i> , Ragonot	17

LARVÆ OF BRITISH SPECIES DESCRIBED IN THIS VOLUME.

	PAGE
<i>Crambus warringtonellus</i> , Buckler	129
<i>Emmelesia blandiata</i> , "	180
<i>Ennychia octomaculalis</i> , "	57
<i>Eupithecia inturbata</i> (subciliata), Speyer.	142
<i>jasioncata</i> , Creve	80
<i>Eupœcilia ambigua</i> , Barrett	152
<i>Gelechia brizella</i> , Moncreaff	56
<i>Hydrecia nictitans</i> , Buckler	195

	PAGE
<i>Himera pennaria</i> , Hellins	33
<i>Miana expolita</i> , Buckler	76
<i>Nematus glutinosæ</i> , Cameron	194
<i>salicivorus</i> , "	195
<i>Papilio Machaon</i> , Buckler	244
<i>Scoparia truncicolella</i> , Porritt	106
<i>Scopula lutealis</i> , Buckler.	147
<i>Porritt</i>	189

REVIEWS.

"Papilio," organ of the New York Entomological Club.	20
The Micrographic Dictionary, 4th Edition	72
Bidrag till nordvestra Sibiriens Insektafauna. Coleoptera, Pt. i: J. Sahlberg	90
Hemiptera Argentina: C. Berg	90
Transactions of the Norfolk and Norwich Naturalists' Society	90
The Butterflies of Europe: H. C. Lang	91
Les Cynipides: J. Lichtenstein	215
Proceedings of the Perthshire Society of Natural Science.	238
Report of the Entomologist of the U. S. Department of Agriculture, 1880: J. H. Comstock	263

OBITUARY.

	PAGE
Baron de Chaudoir	20, 43
John Blackwall	20, 45
W. Garneys	144, 163
J. B. Blackburn	164
John Gray	190

	PAGE
C. G. A. Giebel	215
Jules Putzeys	215
Sir C. Wyville Thomson	264
C. R. Darwin	278

Entomologist's Monthly Magazine

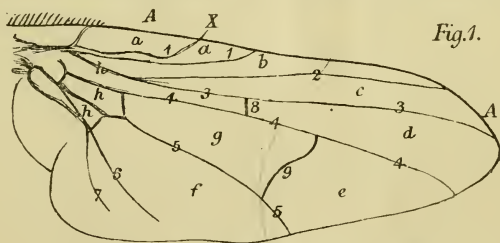
VOLUME XVIII.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

In the following paper I shall attempt to give a list of the British species comprised in the great Sub-Family of *Muscidæ* named *Anthomyiidæ*. This group of flies may be distinguished from the more highly developed or typical *Muscidæ* by the first posterior wing-cell being fully open; the fourth longitudinal vein running direct to the margin of the wing, without being bent upwards towards the third longitudinal vein in a curve or angle as in the *Tachinidæ* and *Muscidæ*. The *Anthomyiidæ* are separated from the various groups of smaller or acalypterate *Muscidæ* by the alulets or scales being more or less highly developed.

For the illustration of the characters of some of the genera, and also of distinctive points in new or obscure species, it will be useful to introduce some figures of the wings, and I shall first insert an explanatory sketch to enable the student to understand the names of the veins and cells to which reference is made. The terms which I have adopted are the same as those used by Loew in his introductory chapter on the terminology of *Diptera*, inserted at the beginning of the first part of his Monographs on the *Diptera* of North America.



* Fig. 1—Wing of *Hyetodesia lucorum*.

A A costal vein; 1.1. first longitudinal vein, often double, when the second branch is named the axillary vein; 2. second longitudinal vein; 3.3. third longitudinal vein; 4.4.4. fourth longitudinal vein; 5.5. fifth longitudinal vein; 6. sixth longitudinal or anal vein; 7. axillary vein; 8. internal transverse vein; 9. external transverse vein; a.a. costal cells; b. marginal cell; c. submarginal cell; d. first posterior cell; e. second posterior cell; f. third posterior cell; g. discoidal cell; h.h.h. basal cells; X. costal spine, always (when present) at the point of termination of the first branch of the first longitudinal vein.

In the 11th volume of this Magazine, p. 199, I gave a sketch of

the different genera into which the numerous species of this Sub-Family may be grouped. More extended experience has caused me to somewhat modify my views, and to introduce some new genera; therefore, before enumerating the species contained in each genus, I shall briefly give the characters by which such genus may be distinguished from the others; and at the end of the list of species in each genus, I shall make a few remarks on such species as possess points of interest or obscurity, and lastly describe any new species.

1. POLIETES, Rond.

Macrosoma, R. Desv.

Aricia, pt., Auctt.

Gen. ch.—Eyes hairy, contiguous in males; arista plumose; margins of facial groove ciliated from the vibrissæ to the base of the third joint of the antennæ; alulets large, the lower scale twice as long as the upper; abdomen short and rounded; bristles on the back of thorax and abdomen small and soft; anal vein terminating a short distance from the margin of the wing.

1. LARDARIA, Fab.

2. ALBO-LINEATA, Fall.

floralis ?, Desv.

2. HYETODESIA.

Yetodesia, Rond.

Aricia, pt., Auctt.

Gen. ch.—Eyes hairy*, contiguous or approximate in the males; arista plumose or sub-plumose; facial groove bare, or nearly so; alulets generally large, but variable in size, the lower scale however always longer than the upper; abdomen oval or oblong; anal vein prolonged, but not reaching the margin of the wing.

Sect. 1—*Legs entirely black.*

1. INCANA, Wdm.

7. OBSCURATA, Meig.

2. LUCORUM, Fall.

8. VARIABILIS, Fall.

3. MARMORATA, Zett.

9. LONGIPES, Zett.

4. SERVA, Meig.

atra, Fall.

5. DISPAR, Fall.

10. UMBRATICA, Meig.

nivalis, Zett.

11. SEMICINEREA, Meig.

6. DUBIA, *sp. n.*

Sect. 2—*Legs partly pale (fulvous or rufous).*

12. LETA, Fall.

19. BASALIS, Zett.

13. PERDITA, Meig.

20. RUFIPALPIS, Macq.

trimacula ?, Bouché.

21. ABDOMINALIS, Zett.

14. ERRANS, Meig.

22. SIMPLEX, Wdm.

posticata, Meig. & Zett.

15. SIGNATA, Meig.

23. SCUTELLARIS, Fall.

16. LASIOPHTHALMA, Macq.

populi, Meig.

17. VAGANS, Fall.

variegata, Meig.

18. ERRATICA, Fall.

24. PALLIDA, Fab.

H. SERVA, Meig.

The specific characters assigned to this species are insufficient to distinguish it from its congeners, especially from *H. lucorum* and *H. marmorata*; it may, however, be easily determined by the following points of difference: in *H. serva* there are only three bristles behind the transverse suture on the thorax, in each of the two parallel longitudinal rows of setæ which are placed between the middle and lateral black stripes; while in *H. lucorum* and *H. marmorata*, as in most of the higher Anthomids, there are four bristles in each row behind the suture. In *H. serva* the external transverse vein of the wings is straighter than in either of the other species, and not clouded with brown. The abdomen in *H. serva* is without the rounded black spots seen in *H. lucorum*, but marbled or tessellated as in *H. marmorata*. The posterior tibiæ of the males in *H. serva* have no long hairs or ciliæ on their inner sides, while in *H. lucorum* they are thinly ciliated with a few long hairs along the upper two-thirds of their inner surfaces, and in *H. marmorata* along their lower two-thirds. *H. serva* is usually rather smaller than either of the other two species. It is much less common than *H. lucorum*.

H. DISPAR, Fall.

There is no doubt but that this is synonymous with *H. nivalis*, Zett. Rondani describes the latter species as having the posterior tibiæ densely ciliated ("intus sub-barbatis seu dense villosis"). He does not describe *H. dispar*, and neither Fallen, Meigen, nor Zetterstedt says anything about the armature of the legs in either species; so, following Rondani, I named the first specimens of this fly that I saw *nivalis*; but, upon obtaining typical individuals of *H. dispar* from the continent, I found that they had also the beards on the posterior tibiæ, and were in every way identical with the English specimens named *nivalis*, so Fallen's name must stand. This species is rare: I received one male from Mr. C. W. Dale (Dorset), and found one in a collection of unnamed insects made by the late Mr. F. Walker.

H. VAGANS, Fall.

I have introduced this species into the British list upon the authority of the late Francis Walker; but I have never seen a specimen, either English or continental, that agrees with the description given by authors. Mr. Kowarz, of Franzensbad, sent me two which he had taken from the collection of Professor Loew, in which they were placed and named as *vagans*, but they were exactly similar in all points to *H. basalis* of Zetterstedt, only of rather a larger size. The femora were all entirely pale, and the palpi black, while in the description of *vagans* given by Fallen and Meigen the anterior femora are given as partly black, and Meigen says the palpi are red at the base. I suspect that *H. vagans*, Fall., and *H. basalis*, Zett., are only varieties of the same species, but this can only be determined by the examination of typical specimens in the collections of Fallen and Meigen.

H. SCUTELLARIS, Fall.

This species varies very much in several particulars, and has, on this account, been described under several different names. Sometimes the antennæ are entirely black or grey, at other times the first two joints are rufous. In some specimens the arista is longer-haired than in others. The scutellum is sometimes entirely yellow,

but it is often more or less grey at the base. Again, there is often a narrow longitudinal black stripe on the dorsum of the first and second abdominal segments, as well as a black line on the posterior edges of the segments, while in other specimens the abdomen is entirely unmarked. These and some other minor distinctions are by no means constant, and I can find no essential differences of structure; therefore I believe the *H. populi* and *H. variegata* of Meigen are only varieties of *H. scutellaris* of Fallen.

H. DUBIA, sp. n.

Oblongo-ovato cinerea; fronte vix prominente; ore non producto; oculi in mare subcontigui; seta breviter plumata; thorace lineis quatuor distinctis nigris; abdomine vitta dorsali maculisque indeterminatis nigro-fuscis; vena transversali interna pone medium cellulae discoidalis posita.

Long. 3½ ad 4 lin.

Head: forehead very slightly prominent; eyes of male long-haired and subcontiguous, separated by a narrow black line, which is bordered by a silvery-white margin; face silvery-white, with black reflexions; epistome slightly projecting; antennae narrow, third joint about twice the length of second; arista short-haired.

Thorax light ash-grey, with four longitudinal very distinct black stripes nearly equal in width, but varying somewhat in breadth in different specimens; the outer pair interrupted at the suture; scutellum covered with ash-grey tomentum, of which it is sometimes partially denuded so as to leave a black spot at the base or in the centre; four setae are placed longitudinally on each side behind the suture in the space between the middle and lateral stripes.

Abdomen grey, with a longitudinal black stripe extending on the dorsum over the first two or three segments; sides marked or tessellated with black patches, which assume the form of irregularly shaped spots on the bases of the segments, when viewed in some directions; third segment without setae on the disc.

Wings slightly tinged with yellow at the bases and along the veins; internal transverse vein placed a little behind the centre of the discoidal cell, and almost exactly opposite the end of the auxilliary vein; external transverse vein slightly oblique and a little sinuous.

Calyptra nearly white. *Halteres* yellow. *Legs* black; posterior tibiae without any long hairs on their anterior or inner surfaces, and with only a few setae on their outer sides.

This species is not common. I have three British specimens, one of which I captured near lake Windermere, and another near Wakefield; I also received one from Mr. Kowarz, of Franzensbad, taken in Hungary. I first named it *H. lugubris*, Meig., but, on receiving a typical specimen of that species from the continent, I at once saw that they were quite distinct. It more closely corresponds to the description of *H. consobrina*, Zett., and is perhaps the same, but Zetterstedt's account is so short and incomplete, that his species cannot be identified with certainty without the examination of the specimens in his collection, so I have thought it better to describe it as new.

It may be distinguished from *H. lugubris* of Meigen (*H. morio*, Zett.), of which I have not seen a British specimen, by the mouth being much less prominent and less hairy; by the thorax being more grey and more distinctly striped; by the dorsal abdominal stripe being narrow and nearly even, while in *lugubris* it is dilated on

each segment into a wide triangular mark; by the posterior tibiæ being much more thickly and strongly ciliated on their outer sides in *lugubris*; and lastly, by the internal transverse vein being placed before the centre of the discoidal cell in *lugubris*, instead of behind it as in *dubia*, and therefore some way before the termination of the auxilliary vein.

H. dubia bears considerable resemblance to *H. serva*, but may be easily distinguished by the arista being much longer-haired in the latter species, and by there being four thoracic setæ behind the suture in *dubia* and only three in *serva*. By the light grey colour and distinct stripes of the thorax, *dubia* bears a considerable resemblance to *H. lata*, but the latter has only three posterior thoracic dorsal bristles as in *serva*, and pale coloured tibiæ.

(To be continued).

ON THE SUPPOSED EFFECT OF THE WINTERS IN JAPAN ON THE SMALLER COLEOPTERA.

BY GEORGE LEWIS.

The cold weather commences here early in December and continues until the close of February, the whole of this period being excessively dry, and this year no rain-fall has been registered since the 26th November, except a "trace of rain" on the 30th December.

The following is extracted from the meteorological reports published in the daily papers:

1879—1880.	1878—1879.
December... 271 inches of rain and snow.	088
January ... nil.	1325
February ... 3505 (1487 last week).	3973 (3250 in last week).

The winters in Japan vary little, and a two years' record suffices to show the average amount of rain and snow, but the fall in the other nine months of the year is variable and uncertain; the annual downpour being in one year 42 inches, and in another 122 inches. An average of seven years, 1863—1869, gives 70 inches, two-thirds of which fell in the six months of April to September. In winter the wind is almost continuous and often boisterous, and this adds to the dryness, and as there is little dew, freezing is attended with the least possible hoar frost. Where there are no trees, the hills and land generally are covered with a small grass, with species of *Arundinaria* and *Bambusa*, and these are all dry and yellow, and a stranger might well conceive that the grass was dead and beyond recovery. Ridges and banks are dry, and even the edges of ponds afford no swampy or marshy places, and the only contrast to all this hay-coloured landscape are the patches of *Amaryllidæ* which have thrown up dark leaves in the more sheltered situations; with herbage like this there is no

hiding-place for small beetles; there are no tussocks or compact roots where they can hibernate—moss and everything else is all dry and dusty together.

If I went out to hunt as I should do in England, I should probably not see a *Homalota*, perhaps not even a *Philonthus*; but in haystack refuse I should get one or two specimens of *Corticaria*, a *Pæderus*, and a few of the exceedingly common *Ancylopus*. The chances would be against my seeing *Stenus*, *Quedius*, *Cryptophagus*, or *Atomaria*. In a general way, there are no beetles to be had; a few only may be found under the small loosened pieces of bark on *Planera acuminata*—a mode of collecting familiar to entomologists who have wintered at Cannes or Mentone. But if I go to the hills and bluffs, or to the plantations, seeking out the sheltered spots and working round the edges of ponds or reservoirs (where water is permanently stored for irrigation), I find nothing, all is dry down to the water's edge. In the forests, at altitudes of 2500 and 3000 feet, more can be done in barking the beeches and oaks, and by knocking the large decayed trees to pieces over a cloth; but even in the mountains there is no moisture in the moss, and nothing living inhabits it.

The 22nd and 23rd December I spent in an elevated forest about 50 miles from this, and if I mention the genera I found, it will show the character of my captures. All occurred in fair numbers, and many abundantly. *Cucujus*, *Brontes*, *Pediacus*, *Læmophlæus*, *Prostomis*, *Cicones*, *Rhysodes*, *Endophlæus*, *Tarphius*, *Elater*, *Platypus*, *Trypodendron*, a few *Piestini*, and two tree *Homalotæ*. Of the described *Coleoptera* of Japan at this time, not one per cent. are *Homalotæ*; and although I have recently added a large number to the list, I believe there are not more than four or five (amongst the new ones) of this genus; yet, in spring and summer, I have been very careful not to neglect the smallest *Brachelytra*. A few *Homalotæ* or *Oxyrodæ* put into a pill-box and stored in a dry room, will soon be dead, and the dryness of the winter here corresponds with the pill-box condition of such beetles. It might be thought that in a country like this, where insects attain, as a rule, greater dimensions than in Europe, the smaller ones would give place to the larger, but second thoughts will not favour this view, and I am inclined to refer the scarcity of little beetles wholly and simply to the dryness in the winter season, and I believe that on investigation the *Tineæ* will be found to exist here in the same proportion only. Last spring and summer I obtained very few small *Staphylinidæ* from fungi, yet these vegetables teemed with insect-life, chiefly *Heteromera* and small *Erotylidæ*, but I only saw two *Staphyli-*

nidæ in profusion, viz., *Philonthus cyanipennis* and *Oxyporus angularis*, which are giants to the little animals which form the majority of their family in Europe.

In Yezo, and in the north of the main island, much snow falls in the three months I refer to ; but the moisture arising from it, such as would support insect-life, would chiefly operate when it melted in the spring. I think, therefore, with very slight modifications for various latitudes, my remarks on the climate will apply to the whole of this empire, for in the north there is a drier autumn, which would counteract any advantage derived from the snow.*

Grand Hotel, Yokohama :

January 16th, 1881.

THE COLEOPTERA OF ASKHAM BOG, YORK.

BY THE REV. W. W. FOWLER, M.A., F.L.S.

Askham Bog has long been known to Entomologists as one of the best localities in the kingdom for water beetles. Thanks to the kindness of Archdeacon Hey, who may be said to have made the locality, specimens of its chief productions are in most good collections, but few people are aware of the number of species that exist within quite a small area. The Bog is a depression of the boulder clay, filled with peat, and is very likely a solitary relic of a bog that once extended over a much wider area ; in fact, there are signs, at present, which seem to show that even the portion that is left will, at no very distant period, be dried up.

The Bog may be divided into two portions, Askham Bog proper, which is not very productive, and Chandler's Whin ; between these two parts only one or two fields intervene, but the fauna seem almost entirely different. Chandler's Whin, in which almost all the good things are found, consists of some dozen or so small ponds edged with deep moss, and separated from one another by most treacherous grassy ground, or, where there is a rise, by small slopes covered with gorse and trees ; the divisions are only a few yards wide in many cases, and yet the species of insects, and the relative numbers of the species, are singularly different in the different ponds ; this is probably due to the influence of springs, character and thickness of the bottom soil, and the different growth of plants consequent thereupon, and though worth mentioning, is not by any means a strange fact, when we re-

* P.S., Jan. 27th. The humidity registered by the wet and dry bulb thermometer on the 25th January, was 7 a.m., 37 %, and 7 p.m., 34 %, but of course *this* is exceptional even here.

member how very local many insects are even on land, and how they may be found in profusion within a few yards, while, outside that line, not a specimen is to be taken.

In compiling the following list, I have been greatly assisted by Archdeacon Hey and his son, the Rev. W. C. Hey. I have inserted common as well as rare species, as in many cases the species that abound elsewhere are conspicuous for their rarity.

The list contains 40 *Hydradephaga* and 20 *Philhydrida*, besides other rare beetles.

HYDRADEPHAGA.

Haliphus obliquus, F., rare; I have only found one specimen. *H. ruficollis*, De G., abundant.

Hyphydrus ovatus, L., abundant in Askham Bog; unknown in Chandler's Whin, until I took a single specimen on April 30th last.

Hydroporus inæqualis, F., not very common. *H. decoratus*, Gyll., abundant, but confined to Chandler's Whin; this is by no means a common insect elsewhere; Stephens (Illust., ii, 41) says that he only knew of one or two British specimens. *H. granularis*, L., very abundant. *H. dorsalis*, F., apparently not very common. *H. oblongus*, Steph., rare, but can generally be found; it is apparently an early spring insect. *H. rufifrons*, Duft., rare; only found in a stream running along one side of Askham Bog proper. *H. erythrocephalus*, L., very common. *H. lituratus*, F., not common. *H. planus*, F., very abundant. *H. melanocephalus*, Steph. (*pubescens*, Gyll.), common. *H. nigrita*, F., not common. *H. tristis*, Pk., not common. *H. obscurus*, Sturm, common. *H. vittula*, Er.: it is doubtful whether this insect has ever been found in the Bog; I am inclined to think that another species has done duty for it. *H. palustris*, L., conspicuous by its rarity in Chandler's Whin; common elsewhere. *H. angustatus*, Sturm, not uncommon. *H. Scalesianus*, Steph.: Stephens named this species after Mr. R. Scales, who took two specimens in Norfolk (Illust., ii, 57); this locality was, however, lost, and the insect was never again found until Archdeacon Hey discovered it in Askham Bog, or rather Chandler's Whin; it is always rare, but may be taken sparingly at certain times of year, it seems to be attracted by cow-dung in the water; Chandler's Whin is, as far as I know, the only British locality, at present known, for this species, which appears to be rare on the continent. *H. lineatus*, F., common, but local.

Noterus sparsus, Marsh., abundant.

Laccophilus minutus, L., not very common.

Ilybius fuliginosus, F., common. *I. ater*, De G., common. *I. obscurus*, Marsh., not uncommon. *I. guttiger*, Gyll., not uncommon.

Colymbetes fuscus, L., apparently rare; I have not seen a specimen in the Bog myself. *C. Grapii*, Gyll., rather common; more frequently met with than any other *Colymbetes*. *C. exoletus*, Forst., rather common.

Liopterus ruficollis, Schal. (*Agabus agilis*, F.), rather common; this used to be considered a rarity, but seems now to be common: I have taken it both at Askham Bog and near Lincoln, not uncommonly this year.

Agabus bipustulatus, L., not abundant, as it usually seems to be in most places. *A. chalconotus*, Pz., has occurred. *A. Sturmi*, Schon., not common. *A. uliginosus*, L., rare. *A. undulatus*, Schr. (*abbreviatus*, Steph.): this, perhaps the prettiest of

the *Agabi*, though rare in most localities, is the commonest insect in the Bog, and, at certain periods of the year, may be taken by hundreds. *A. unguicularis*, Th., very common.

Dytiscus marginalis, L., not uncommon. *D. circumcinctus*, Ahr., rare; a few specimens have been taken.

Hydaticus transversalis, Berg: several specimens have been taken on one side of a small pond in Chandler's Whin, but it has occurred in no other part of the Bog.

PHILHYDRIDA.

Hydrobius fuscipes, L.: this ubiquitous insect is as abundant as it seems to be everywhere else.

Helochares lividus, Forst., not common.

Philhydrus testaceus, F., very plentiful. *Ph. nigricans*, Zett., not uncommon. *Ph. ovalis*, Th., not common. *Ph. suturalis*, Sharp: this seems very abundant; it appears to be this species, and not *marginellus*, F., as the yellow spots on the clypeus are well defined in all the specimens I have examined.

Anacæna variabilis, Sharp, very common.

Laccobius minutus, L., very common.

Limnobiust truncatellus, Thunb., not uncommon. *L. picinus*, Marsh.: this beetle, the smallest of the *Philhydrida*, is exceedingly abundant; I have also found it near Stamford Bridge, a few miles from York, but have never come across it elsewhere.

Chaetarthria seminulum, Pk., common.

Helophorus aquaticus, L., *granularis*, L., and *griseus*, Hbst., all very common. *H. æneipennis*, Th.: I know of only one specimen of this insect having been taken in the Bog.

Ochthebius pygmæus, F., common.

Hydrochus elongatus, Schall., not common.

Hydræna riparia, Kug., common. *H. palustris*, Er., not uncommon; this is one of the specialties of the Bog.

Cyclonotum orbiculare, F., common.

Besides water beetles, several exceedingly good species are taken in Askham Bog: the best of these is the very distinct and very rare *Pselaphus dresdensis*, Hbst., of which about a specimen a year is found; *Gymnusa brevicollis* also occurs; *Oodes helopioides* is not uncommon; and *Blethisa multipunctata* has been once taken under rubbish. The Bog has not been worked systematically for the semi-aquatic insects; but *Bagous petrosus*, *Tanyssphyrus lemnae*, and *Phytobius comari* are found, and probably many other species might be. *Donacia lemnae* is at times abundant, but only in one particular pond, and other species are perpetually turning up.

I may add that the Bog is now closed to the public, but leave to work it can be obtained through Archdeacon Hey, in whose company I have, within the past year, taken the greater number of the species above mentioned, and who is as enthusiastic a collector now as he was in the old days of Curtis and Stephens.

Lincoln: May 11th, 1881.

LIST OF *LEPIDOPTERA* OBSERVED IN THE NEIGHBOURHOOD
OF GALLIPOLI, TURKEY, IN 1878.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

On the 1st of May, 1878, I arrived at Gallipoli, and joined H.M.S. "Cygnet," and from that date up to the 12th of August, the ship was employed between Gallipoli and the Bulair lines, being about a fortnight at each place alternately, with one exception, when we took a three days' cruise to the Marmora islands. During this period I devoted a good deal of my spare time to collecting and observing the *Lepidoptera* of the vicinity; perhaps, a list of the species taken, together with notes of their habits, and descriptions of a few of their larvæ, may not be altogether uninteresting.

Before commencing the list it may be as well to give a rough account of the country. My hunting-grounds in the neighbourhood of Gallipoli comprised a belt, extending along the coast to the valley of Ak-y-lar, some six miles to the south-westward of the town, and about three miles in width inland to the westward. In the town itself, and its environs, there were numerous gardens, where a variety of fruit trees were cultivated; and in the low-lying country beyond, there were extensive fields of wheat, barley, maize, and cotton, interspersed with large vineyards, cherry orchards, and olive groves, with occasionally a fine old walnut or poplar-tree rearing its head far above its neighbours, and forming, in many cases, a conspicuous landmark. Through these fields ran the Utze Kionpron Dérèh, a small muddy stream, with elm, plane, poplar, and willow trees growing on its banks, and the undergrowth luxurious, in places, with impenetrable masses of brambles, blackthorn, honeysuckle, &c., while directly out of its black slimy bed sprung a profusion of sedge, *Lythrum*, *Eupatorium*, sweet-smelling *Galium*, and a variety of rushes. As one passed, frogs innumerable leapt nimbly from the banks, and mud-covered terrapins shuffled clumsily into the rank herbage, or dropped with a dull splash into the dirty ooze. Sailing and flapping above the stream, or quartering the adjacent fields, were graceful harriers and lazy buzzards on the look-out for frogs or lizards, and high in the clear sky the little kestrel (*Falco tinnunculoides*) hovered with quivering wings, waiting his turn for a swoop at similar prey. Above the cherry and olives the brilliant-hued bee-eaters hawked in flocks, while the no less beautiful roller flew from tree to tree. From the shadiest retreats came the soft notes of doves, and the pretty black-headed bunting (*Emberiza melanocephala*), swaying to and fro on the topmost twig of a willow bush, repeated its monotonous song. On the paths by the

side of the stream crested larks delighted to dust themselves, and from the corn fields their larger brethren, the Calandra larks, sprang, and with joyous notes ascended aloft until nearly lost to sight. Here and there a huge stork walked sedately on the look out for a meal for his family, who were waiting his return in their nest on a neighbouring chimney.

Above the cultivated fields, towards the valley of Ak-y-lar, the country rises into rounded hills or downs, intersected at every half-mile by narrow gullies, through which, during the winter months, little streams run into the sea, but in the summer only a few stagnant pools remain. Patches of prickly mimosa (the "wait-a-bit" thorn of sportsmen), stunted blackthorn bushes, and tufts of rushes, grow sparingly in these valleys; while the downs themselves are covered with mosses, lichens, thistles, wiry grass, cotton rush, and innumerable clumps of a low-growing prickly shrub, which, at a distance, looked like heather. As one walked across, two or three species of *Zygæna* would fly heavily by and settle on a thistle flower; but, with the exception of *Vanessa cardui*, *Lepidoptera* on these uplands were by no means abundant, being represented throughout May and June by *Colias Edusa*, *Melanargia Galathea* and *Larissa*, *Epinephele Janira*, *Spilothyrus alcea*, *Hesperia Thaumata*, *Macroglossa stellatarum* and *croatica*, &c., and the following month *Satyrus Briseis* and *S. statilinus* var. *Allionia* were the only notable additions. A remarkable Neuropteron (*Ascalaphus Kolyvanensis*), with conspicuous black and yellow wings, was somewhat plentiful, and when first seen, was taken for some species of *Zygæna*, as it flew much in the same fashion.

On arriving near the valley of Ak-y-lar, the downs gradually slope towards the stream of Buyak Dérèh, which flows through its centre, and on the opposite side there is a broad tract of cultivated country, bounded beyond by a lofty range of thickly wooded hills. The bed of this stream is in some places thirty or forty yards wide, and although in the summer it contains but little water, yet it was easy to see that it is occasionally swollen by winter rains into a formidable torrent. Trees and brushwood grow plentifully on its banks, and, in addition to the species already enumerated as flourishing by the side of the stream near Gallipoli, elm, oak, broom, and barberry were observed. However, notwithstanding that this valley, in comparison with the surrounding country, looked favourable as a collecting ground, yet, on trial, it did not quite come up to one's expectations. *Limenitis Camilla* floated gracefully amongst the brushwood wherever honeysuckle grew; *Lycæna Argiolus* confined itself to the barberry bushes, upon the

flowers, flower-buds, or tender leaves of which its larvæ perhaps may feed (for there was no holly to be seen); *Vanessa c-album* and *V. polychloros* were rather scarce, but to be found during the warmest part of the day sitting on the trunks of plane and willow trees in shady spots, where also *Pararge Roxelana*, a butterfly of retiring habits, was first noticed. In open places among rushes and coarse grass *Melanargia Larissa*, with its variety *Herta*, *Spilothyrus altheæ*, *Hesperia Thaumias* and *Actæon* were numerous, and now and then *Heliothis dipsaceus* and *H. armiger* might be seen on a thistle head; but the grandest prize of all was the beautiful *Argynnis Pandora*.

The other hunting grounds were near the celebrated Bulair lines, a few miles to the eastward of Gallipoli, and were bare as compared with the locality above described, for every tree or bush that could afford shelter to an advancing enemy had been cut down. Nevertheless, there were a few favoured spots which invariably produced something fresh at each visit. Our position was about two hundred yards from the shore, and, upon landing, we had to cross a narrow belt of sand-hills into an extensive grassy plain, which, in some places, was damp, marshy, and overgrown by rushes. Beyond this the hills rose in undulating slopes to the heights of Bulair, upon the summit of which stood Fort Sultan, commanding the whole country on each side of the isthmus, from the gulf of Xeros on the north, to the shores of the sea of Marmora on the south. In addition to this huge fort, there were a number of smaller ones thrown out in advance on the crests of the surrounding hills, and the whole, at the time we were there, were occupied by some 25,000 men. The little valleys between these hills, being near and convenient, were the chief collecting grounds, although the heat during the middle of the day was very great, and there was scarcely any shelter, and but little breeze until three o'clock in the afternoon, at which time it was usually the custom to go on shore. Of course the whole country was overrun by Turkish soldiers, and they displayed a considerable amount of curiosity at my entomological proceedings, following me about, and asking all manner of questions; but as I did not understand a word of their language, nor they of mine, our conversation could hardly be called interesting, although a good deal was to be made out by "dumb show." One day an intelligent-looking old Turk evidently fancied he had discovered what I was up to, for he came running to me with a small black beetle (a *Cantharis*, I believe) in his hands, showed it to me, then smashed it up and began rubbing it into his neck. I laughed, and nodded my head, and the old fellow was mightily pleased; and, from what I could

make out, turned round and informed his companions that I was a doctor. After this, I often had two or three soldiers following me, and they would run after butterflies, knock them down with their fezzes, and bring me the mangled remains! I used to pretend to be much obliged, and rewarded them with cigarettes.

The Turkish soldiers and peasantry are a fine set of fellows, and I always met with the greatest civility from them. Many of the farms in the neighbourhood of Gallipoli are owned, or rented, by Greeks, and the difference between the two races was most marked. In this country, where there are scarcely any public roads, one had constantly to pass through vineyards and gardens, where the Turk would always salute one courteously, and often offer fruit; whereas, the Greek would scowl and mutter what (if one could have understood it) was doubtless abuse.

But to return to Bulair. I was often fond of landing early in the morning, before breakfast, bathing in the beautiful blue water, and then taking a stroll for an hour over the sandhills into the rushy plain beyond. Calandra larks at this time of the day would be in full song overhead; terns busily flitted along shore, and occasionally darted down and secured a silvery little fish, although withal angry at the invasion of their domain, for they were nesting close at hand, as were also Kentish plovers, and on the plain, a colony of pratincoles. Amongst the rushes on the sandhills several species of *Ino* buzzed about commonly, also *Botys sanguinalis*, and a long-legged queer-looking *Pyræ* (*Ilurgia* —?, a species I saw unnamed in the British Museum), while the larvæ of *Thais cerisyi* in certain places were frequent. Just above high water mark, on plants of *Verbascum nigrum*, larvæ of *Melitæa Trivia* were abundant, and one morning, while taking some of them, I noticed a tiny ball of dusky down hiding away beneath a bunch of leaves, and, upon picking it up, discovered I had found a young Little Tern, such a pretty creature. Upon setting it down, it ran off sturdily, and soon hid itself again, to the evident satisfaction of its parents, who were clamouring vociferously overhead. The plains produced *Melanargia Larissa*, *Polyommatus Thersamon*, *Agrophila sulphuralis*, &c., in numbers, and I generally went on board to breakfast with my boxes full.

It will be observed that the following list (wherein I have adopted the arrangement and nomenclature of Dr. Staudinger) contains very few *Noctuæ* and *Geometræ*, and this is owing to the fact that it was not considered safe to go into the country after nightfall, as there were many tramps and refugees about, who might have attempted to rob one, although by day, I have been miles away by myself, and was never molested.

(To be continued).

NOTES ON *THYSANURA* COLLECTED IN THE CANARIES AND MADEIRA.

BY H. N. RIDLEY, M.A.

By the kindness of the Rev. A. E. Eaton, I have received several specimens of *Thysanura* collected by him in the above-mentioned localities, in the latter part of the year 1880; among them were specimens of *Lepisma saccharina*, L., from the hotels at Puerto de la Orotava, in Teneriffe, and Los Palmas, in Grand Canary. This insect is common in houses all over Europe, and is possibly indigenous, but I have never heard of its being found at any distance from human habitations; it would be interesting to discover the extent of its distribution, and whether it lives anywhere independently of man.

Lepisma mauritanica, Lucas. There are two specimens agreeing closely with Lucas' description of this insect, except in two or three points. Lucas describes his specimen (for he only took one) as yellowish-grey, washed with brown: whereas, my specimens are said to have been of a dark mouse-brown colour. Lucas also affirms that the spots in the two exterior rows on the abdomen are much larger than those of the inner row; I can, however, see no difference in mine. Lastly, he says that the first abdominal segment has no spots; but in these specimens they are plainly visible. I have no doubt, however, that I am correct in referring these specimens to that species, they were taken near Los Palmas and on Pico Bandana, under stones, at an altitude of from 350—1500 feet. Lucas' specimen was collected in Algiers.

There are also in the collection several specimens of a *Lepisma*, which appear to me to be new; they were taken at Santa Cruz de Teneriffe, on a hill above the town, and under stones, at an altitude of 500 feet, and also under stones at Safi, on the Morocco coast, in the months of December and January.

LEPISMA EATONI, *n. sp.*

Length, 9 mm. Breadth of thorax in the widest part, 2 mm. Colour, with the scales, dark grey above, under-surface lighter, anal region fuscous; without the scales dull yellow. Antennæ three-fourths of the length of the body, inserted in front of the eyes, the basal segment broad, the second short and thick, fuscous, with the apex darker, the rest of the antennæ light brown, pilose. Head short and broad, distinctly separated from the thorax, fore-part covered thickly with fawn-coloured hairs. Thorax long, not much broader than the head, segments equal, sides and breast covered with rather long fawn-coloured hairs, which, on the lateral margins, spring from about seven dark spots. The abdomen tapers but little, and is short in contrast with the long thorax: the caudal setæ are brown, with rings of white, pilose; but as they are not perfect in any of the specimens, I cannot give their length.

20, Portsea Place, Connaught Square:
April, 1881.

The Insectarium at the Zoological Gardens.—Within the last few weeks a new house in the Zoological Society's Gardens has been opened, which promises to be of great interest to the public generally, and to entomologists in particular. This is an "Insectarium," or house devoted to the exhibition of living specimens, in their various stages, of the class of Insects. Such an exhibition is not absolutely new, it is true, for something of the kind has been tried already in this country at the Westminster Aquarium, as well as on the continent at the Hamburg Zoological Gardens. In neither case, however, was the experiment made on any large scale, and in the first instance at least, it has not proved, hitherto, a great success. The "Insectarium" stands in what is known as the "North Garden"—as the slip of land lying on the Northern bank of the Regent's Canal is called—not far from the northern entrance to the gardens. It is of an oblong shape, with a glass roof, and with three of its sides, including the south one, also consisting largely of glass. The remaining or northern side is of cement and brick. The floor is paved with tiles, and beneath it hot-water pipes run round the house, which admit of its being kept up to any necessary temperature.

The larger insects are exhibited in glass cages, provided with tops of perforated zinc, and with metal floors in which can be inserted, if necessary, a flower-pot with growing plants for the larvæ to feed on. These cages, which are rather larger than an ordinary Wardian case, are arranged along two sides of the house, those on the south side being at present chiefly occupied by various exotic silk-producing Bombyces, whilst the smaller ones on the north are devoted to English *Lepidoptera* of various species. On tables in the middle of the room are bell-glasses with various aquatic insects, as well as other cages containing smaller species, or very young larvæ of *Lepidoptera*, together with a few insects of other groups.

At the present time, the *Lepidoptera* are best represented. There is a good collection of the cocoons of the Bombyces exhibited, and many of these have come out, and produced beautiful imagoes. Amongst others, *Samia Gloveri* and *P. Cecropia*, *Attacus Atlas* and *Actias luna* may be mentioned as having been exhibited alive during the past few weeks. Eggs of most of these have also been obtained, so that no doubt before long, larvæ of them will be visible, though at present the only silk-moth larvæ shown are those of *A. Yama-mai*.

Of European *Lepidoptera*, imagoes of *Papilio Machaon*, *Melitæa Cinxia*, and *Nemeobius Lucina* may be seen, whilst there are larvæ, in various stages, or pupæ of many others, amongst which those of *Melitæa Maturna*, *Apatura Ilia*, and *Iris*, *Limenitis populi*, and *Silylla*, and *Catocala fraxini* are, just now, perhaps the most interesting.

The other Orders are represented chiefly by aquatic forms at present, in the shape of sundry *Hydradephaga* and *Philhydrida* from amongst the *Coleoptera*, by larvæ of *Agrion*, *Libellula*, and *Ephemera*, together with *Phryganidæ* in their cases, *Nepa*, *Notonecta*, and a few others. The *Hymenoptera* are, as yet, hardly represented, though in time there seems no reason why the visitors to Regent's Park should not be able to study for themselves the habits of the ant and the economy of the hive-bee. Perhaps Sir John Lubbock could help here?

As yet, of course, only a beginning has been made, but enough has even now, we think, been done to prove the success of the experiment, which is of course capable of development to almost any extent. As the season advances, the number of insects exhibited will no doubt become much increased, whilst constant changes,

both as regards the condition of the specimens and the various forms exhibited, will always give the charm of novelty to a visit to this house. It is to be hoped, indeed, that at no distant period the Londoner may be able to contemplate at leisure the charms of a live *Morpho* or *Urania*, without going further from his home than the Regent's Park.

The Insectarium is under the charge of Mr. W. Watkins, already well known to many readers of this magazine, and under him will no doubt daily increase in efficiency and attraction, and so perform its main mission of instructing and amusing the public. When more experience in the working of the Insectarium has been gained, it may also be possible to utilise some of the opportunities now afforded for experiments in such matters as the effect of increased temperature or moisture in producing variation in insects. It would also be interesting to experiment further on the reproduction of *Aphides*, with the object of discovering how many generations in succession of agamo-genetic individuals (if the term may be thus used) could be produced under circumstances favourable for their propagation presented in the Insectarium.—W. A. FORBES, Zoological Gardens: May 10th, 1881.

Notes on Micro-Lepidoptera.—*Coleophora olivaceella*. I was fortunate enough last year to find cases of this rare insect at Armathwaite, near Carlisle. When first noticed, attached to the trunks of trees near *Stellaria holostea*, they were supposed to be cases of *Col. solitariella*, and it was not until the autumn, when I had time to compare the perfect insects which emerged, with a description in a number of the Entomologist's Intelligencer, that the truth was suspected. The larvæ of *olivaceella* appear to feed up in autumn and retire to tree trunks, and perhaps other similar places, for refuge during the winter, thus imitating the habits of *Coleophora Wilkinsoni* exactly. I have not seen the mine, as the larvæ collected last Whitsuntide and bred, and the insects collected this month have alike utterly refused food and appear to be even in the pupa state. In a notice some years ago by Mr. Stainton, he represents the mine as being greener than that of *solitariella*, and he found larvæ feeding in April, which is extremely puzzling.

The cases are almost prostrate on their resting place and are, compared with *solitariella*, shorter, stouter, and more yellow, dusted with greyish spots. The imago is rather like *solitariella*, but is larger, of a darker colour, its wings broader and more glossy, and when the series of each insect are compared the difference is at once very apparent.

Tinea argentimaculella. I think that Armathwaite has also yielded me the larvæ of this insect, as I found many delicate tubes amongst the grey lichens on the rocks, tenanted by light green larvæ with black heads.

As I cannot find anywhere a description of the larvæ of this species, this must be considered as a mere conjecture, hazarded with the view of extracting information from any one who may know.

Elachista humilis. This insect also puzzles me. Can it be the male of *Elachista perplexella*? The Manual says of it "♀ unknown." Now in Brockholes Wood, near Preston, I take yellow larvæ feeding in *Aira cæspitosa*, which produce both the dark males and lighter spotted females, respectively *E. humilis* and *perplexella*, thus reducing the two species into one, whichever name has the priority.

Mr. Murray, of Carnforth, has last year added two species to the Witherslack list, in a male of *Psyche opacella* and one of *calvella*, both of which he most kindly presented to me. We have together looked for cases of these, but are yet unsuccessful.—I. H. THRELFALL, Preston: April 27th, 1881.

[I give here a copy of the description of the larva of *Tinea argentimaculella*, made April 13th, 1859, from larvæ kindly sent me by the late Mr. R. S. Edleston. "Length 3 lines. Elongate, slender, greenish-white; the spots darker, but inconspicuous, except two larger darker spots on the sides (the upper one being darkest and largest) of the 3rd and 4th segments; head black, and 2nd segment black, "except in front. Makes long green tubes of lichen and web."—H. T. STAINTON.]

Suggestions for obtaining the eggs of Acentropus.—I am extremely anxious to study the early stages of *Acentropus niveus*, and shall feel very much obliged to any one who will procure me some eggs: if a small tightly-fitting tin box or two, which would not add much to the collector's *impedimenta*, were carried with the usual chip boxes, and any females that might be captured, were shut up in them with small sprays of the *Potamogeton*, a little wetted, I think the danger of the eggs drying up would be greatly obviated, and I should have a good chance of receiving them in safety, for they might travel through the post in the same boxes.—WM. BUCKLER, Emsworth: May, 1881.

Tortrix Lafauriana, Ragonot, a species new to Britain.—It is with pleasure that I record the capture of the above species. Whilst collecting Micros in July last year, a few miles from this town, I beat out two specimens of a *Tortrix* which I was unable to name. I sent them to Mr. C. G. Barrett, who kindly informed me that they were *T. Lafauriana*. They were taken in a boggy portion of a heath.—E. A. ATMORE, 8, Union Street, King's Lynn, Norfolk: May, 1881.

[*Tortrix Lafauriana* was described by M. Ragonot in the Ann. Soc. Ent. France, 5^{me} série, vol. vi, p. 403 (1876), and also figured. He says that it has been confounded with *croceana*, Hüb., from which it may be easily distinguished by the costal fold in the male; also that it is allied to *sorbiana*, forming a passage from it to the species with pale hind-wings. His description is long, and it will be sufficient to say that *Lafauriana* has a folded and strongly arched costa, hollowed before the apex, the male resembling *sorbiana*, but with shorter wings and yellower colouring, the female approaching more in colouring to *heparana*. The fore-wings in both sexes are glossy, and the hind-wings of a decidedly pale grey. One of Mr. Atmore's specimens agrees most accurately with M. Ragonot's types, the other is redder and more like the female in colour.

This is a very handsome addition to the British fauna, and not easily mistaken for any other species. The locality given by M. Ragonot is Dax (Landes), France.

The larva, which he describes as very variable, feeds there on *Myrica gale*, joining together the terminal leaves, and is very subject to parasites. The species has since been discovered in Holland (*vide* Tijdschrift voor Entomologie, vol. xxii, p. 128).—C. G. BARRETT, Pembroke: 13th May, 1881.]

Vanessa Antiopa at Llandaff.—Shortly after eleven this morning, I disturbed one of these rare visitors in the drive here. It took several high flights around the tree, but very kindly returned close to me several times, and had I been provided with a net I could have caught it easily. During a long course of years this is only the second specimen of *Vanessa Antiopa* I have seen at Llandaff.—J. EARLE OLLIVANT, Bishop's Court, Llandaff: *May 9th*, 1881.

Note on the earlier states of Psylla buxi.—This is one of the commonest species of the genus. The terminal shoots of the plants of the Box (*Buxus sempervirens*) may now be found filled with the creature in its earlier stages. The deformation the shoots assume, caused by their attack, tends to turn the leaves towards each other when they assume a somewhat oval or globular shape. On opening one of these the cavity will be found to contain a quantity of white or starch-coloured opaque particles, amongst which the young green larvæ and nymphs will be found, the former easily distinguished from the latter by their somewhat smaller size and the want of the elytra-lobes —JOHN SCOTT, Lee, S.E.: *14th May*, 1881.

Note on Aphalara nervosa.—Next month is the time for capturing this species of *Psyllidæ* on the yarrow (*Achillea millefolium*), and where the plant grows profusely, I believe the insect, from what I have experienced here, will also be found in considerable numbers. Singularly enough, with all my painstaking, I have been unable to capture the creature in its earlier stages, and I shall feel obliged to any one who takes an interest in the group and is fortunate enough to meet with it in these states, who will forward some to me for the purpose of describing and figuring. Coleopterists are likely to meet with it when sweeping the plant in search of *Ceuthorrhynchideus Chevrolati* which is attached to it, and is to be met with at the same time although not in such fine condition as in September, when the newly-emerged insects are in their greatest perfection.—ID.

Additions to the Morayshire Hemiptera.—In addition to my previous list of bugs occurring in Morayshire, I have to record the following species taken last summer at Forres. *Gastrodes abietis*, in fir cones wherever looked for; *Gerris spera*, *Athymanus brevipennis*, *Trapezonotus agrestis*, *Stiroma albomarginata*, *Enpeleza producta*, and *cuspidata*, both frequently on a dry grass bank, also bred from larvæ; *Liburnia discolor*, *Deltocephalus*, species not yet determined, and *Athymanus striola*, common in swamps; *Typhlocyba cratagi*, beam tree; *T. abrotani*, in profusion on Southernwood; *T. Douglasi*, on beech; *Pantilius tunicatus*, in abundance on hazels.—GEO. NORMAN, Athole House, Pitlochry, N.B.: *May 9th*, 1881.

The muscular power of Rhagium inquisitor.—Having noticed the strength of jaw of several beetles and other insects, I tried some experiments with a specimen of *Rhagium inquisitor*. The beetle was held between the finger and thumb, and the weights used were wrapped in a sheet of paper tied round with a string of sufficient size to give the beetle a firm grip and yet allow it to let go easily when it felt inclined.

The greatest weight raised was 5 ounces, or 2187·5 grains; the beetle weighed exactly 4 grains in a chemical balance, so that it supported in its jaws 547 times its own weight: this is in the same proportion as if a man of 11 stone were to support 37½ tons, a fact that shows clearly the enormous strength not only of the jaws but also of the neck- and other muscles of the beetle. After seeing this experiment, the large weights that one often sees ants carrying to their nests seem quite to sink into insignificance.—W. W. FOWLER, Lincoln: *April 19th 1881.*

Rare Coleoptera near Hastings.—About June or July last, I took three or four specimens of *Cænopsis fissirostris* by sweeping in a wood at Guestling. I have also taken *Athous difformis*, which I believe is one of our rarer species of *Elateridæ*, both at Guestling and also nearer Hastings. *Hippodamia 13-punctata* has also occurred in a damp place near here. These are last year's captures. The only good thing I have met with this year is *Harpalus servus*, taken at roots on the Camber Sandhills, near Rye.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: *16th May, 1881.*

The generic term "Degeeria."—"New species of *Degeeria*." Seeing this announcement in the table of contents of the last number (May) of this Journal, I at once turned to the page (vol. xvii, p. 270) in which it was described, and being a Dipterologist, of course supposed that it referred to a new parasitic fly belonging to Meigen's well-known genus *Degeeria* (Fam. *Tachinidæ*); I was, however, disappointed, and found that the creature in question belonged to a far different Order. I have been induced to make these remarks in consequence of the careless way in which new genera are named.

Meigen separated the Dipterous group in question from the great genus *Tachina* in the year 1838, describing the genus *Degeeria* in the 7th volume (p. 249) of his work on the *Diptera* of Europe, while Nicolet gave the same name to a genus of *Thysanura* in 1841?; therefore, the Dipterous genus must take precedence. Rondani, in the 4th volume of his "*Dipterologiæ Italicæ Prodrômus*," p. 40, has the following note on the genus *Degeeria*: "*Degeeriæ*, Nicol., in *Thysanuris propositum 1841, nomen mutandum in Entomobrya*."—R. H. MEADE, Bradford: *May 14th, 1881.*

[Mr. Meade's citation of the first use of the term "*Degeeria*" by Meigen, in *Diptera*, in 1838, is quite correct. Nicolet afterwards used it for a genus of *Thysanura* (*Collembola*) in his "*Recherches pour servir à l'histoire des Podurelles*," p. 70, published in vol. vi of the *Nouveaux Mémoires de la Soc. Helvét. des Sci. Nat.* (= *Neue Denkschriften schw. Gesell. für Naturwissenschaften*), 1842 (not 1841). Hence there was no necessity for Rondani's change of *Degeeria*, Meigen, into *Entomobrya*; if a change were necessary, it should have been made by the students of *Thysanura*.

The "*Nomenclator Zoologicus*," by Agassiz, has been generally looked upon as a guide to generic terms published up to about 1847, but in this case it is an untrustworthy guide. *Degeeria*, Nicolet, is noticed as a genus of *Thysanura*, without date, but no mention whatever is made of Meigen's prior Dipterous genus of the same name.—R. McLACHLAN].

Review.

PAPILIO; devoted to *Lepidoptera* exclusively. Organ of the New York Entomological Club. Nos. 1—3, January—March, 1881, pp. 1—42, 8vo (Communications to Mr. Henry Edwards, 185, East 116th Street, New York).

A nicely printed and generally well got-up Magazine, of which it is intended to issue ten parts per annum. The publication Committee consists of Messrs. A. R. Groté, Hy. Edwards, and T. L. Mead, whose names are well known to Lepidopterists generally. According to a prospectus, support has been promised from most of the prominent American Entomologists. The contents consist principally of descriptions of new species; amongst the few more general articles is one by Dr. Hagen on the probably apocryphal *Papilio eclipsis*, L.

In No. 1 is a coloured plate representing a beautiful moth recently described as *Edwardsia brillians*! (Neumoegen), an unfortunate name, the generic term having been preoccupied for about forty years, the specific suggesting a scarcity of Latin dictionaries in the States.

We trust that "Papilio" will have more than the short, if merry, life the title suggests; omission of the words "devoted to *Lepidoptera* exclusively" in the title, and acting up to the omission, will certainly tend to the realization of this wish, and also elevate the Members of the Club in the estimation of other Entomologists.

Obituary.

Baron de Chaudoir.—We regret to have to announce the decease of this eminent Coleopterist. Next month we hope to give a notice of his life and labours.

John Blackwall, F.L.S., died on May 11th, at the great age of 92; a short notice will appear next month.

ENTOMOLOGICAL SOCIETY OF LONDON: 4th May, 1881.—H. T. STAINTON, Esq., F.R.S., &c., President, in the Chair.

The following were elected, viz.: R. W. Fereday, Esq., of Christchurch, Canterbury, New Zealand (formerly a Corresponding Member), and C. Foran, Esq., of Eastbourne, Members; and James Edwards, Esq., of Norwich, Subscriber.

Mr. Roland Trimen exhibited ♂ & ♀ of *Papilio Canea*, Stoll, taken in copula, the ♀ of which he considered the mimic of a day-flying *Noctua*. He also exhibited specimens of *Tinea vastella*, Zell. (*gigantella*, Staint.), the larvæ of which had fed in an inkstand fabricated from a hoof of the late Prince Imperial's horse, from which multitudes of the insect appeared. Mr. Stainton said he considered it was still an open question as to whether this moth attacked living animals.

The Secretary read a letter received from the Colonial Office, relative to the appearance of *Phylloxera* on the vines in Victoria; this letter was accompanied by the minutes of evidence taken before a Committee of the Victorian Legislative Assembly, and by other documents. The President announced that the Council had appointed a Committee, consisting of Messrs. Fitch, McLachlan, and Trimen, to investigate, and report upon, the matter.

Mr. Butler communicated "Descriptions of new species of Heterocerous *Lepidoptera* from Japan."

AN ANNOUNCEMENT OF NEW GENERA OF THE *EPHEMERIDÆ*.

BY THE REV. A. E. EATON, M.A.

(continued from Vol. xvii, p. 197).

CALLIARCYS, *n. g.*

Allied to *Habrophlebia* and *Thraululus*, having forceps like those of the latter, but hind-wings like those of the former in outline: cross-veinlets in both wings more plentiful than in *Habrophlebia*. Three long, sub-equal, caudal setæ, in ♂ nearly half as long again as the body. Fore tibiæ of ♂ about a sixth longer than the femur, the tarsus half as long again as the same; hind leg about one-sixth longer than the intermediate leg; hind tarsus about a third as long as the tibia; unguis of hinder tarsi dissimilar in form and size. Proximal joint of ♂ forceps' limb by far the longest. Type *Calliarcys humilis*, *n. sp.* Distrib., Portugal and, perhaps, W. Indies.

Calliarcys humilis, *n. sp.*

Sub-imago. Wings tinted with greyish-black.

Imago (dried), ♂. Thorax deep black above, glossy; abdomen piceous with pale joinings. Legs piceous, the hinder tibiæ and tarsi rather paler. Wings vitreous, slightly tinted with brownish; their neuration piceous-brown. Forceps pale piceous, or pale yellowish-brown. Setæ pale fuliginose, with reddish joinings.

Long. corp., ♂ ♀, 7—9; al., ♂, 7—8·5, ♀, 9; set., ♂, 10—11·5 mm.

Hab.: common on the northern slopes of Foia, near Monchique, and sparingly in other parts of Portugal. Mistaking the imago for *Thraululus*, I did not search for the nymph.

At p. 196, l. 21 from bottom, after "sexes, and" insert "usually."

The prior name, *Isonychus*, Mannerheim, precluding the employment of *Isonychia*, Etn., *Chirotonetes* may be substituted for the latter. It equals *Baëtis*, Walsh, Section B.

In *Heptagenia* and kindred forms, the first and second of the axillary nervures in the fore-wing run sub-parallel with one another, and rather close together, to the inner margin, meeting it either near the anal angle, or at least midway between this and the wing-roots. The nervures interposed between the first axillary and the anal nervure constitute a definite abbreviated group, and do not simulate short branchlets of the anal nervure (in *Siphylurus*, &c., they do). So far as I have been able to ascertain, amongst forms ranked with *Heptagenia* in 1871 (= *Baëtis* of most authors, but not of Leach), the chief differences in the proportions of the tarsal joints, discernible in

the imagines, correspond with differences in the nymphs; and, consequently, I am disposed to accept these differentia as bases for the distinction of genera, although they are only in a few instances accompanied by differences in the neuration of the wings, or in the number of the caudal setæ. To make a complete survey of this group of genera, *Ametropus* may as well be referred to.

AMETROPUS, Albarda.

Intermediate tibia shorter than the tarsus, the proximal joint of the latter about half as long as the former. Fore tarsus in ♂ about four and three-fifths, in ♀ about twice and two-thirds, as long as the tibia; the proximal joint in ♂ once and a half, in ♀ three-fifths, as long as the tibia. Three long caudal setæ. Type, *A. fragilis*, Alb. Distrib., Holland.

ATOPOPUS, n. g.

Hind tibia about half as long as the tarsus, the proximal joint of the latter rather longer than the former. Fore tarsus in ♂ nearly one and two-fifths, its proximal joint almost half, as long as the tibia. The proportions of the intermediate tarsus are more largely in excess of the tibia. Relative lengths of tarsal joints:—fore leg, 24, 18, 14, 8·5, and 6; intermediate, 31, 11, 7, 4, and 5; hind-leg, 30·5, 9, 6, 3, and 5. Two caudal setæ, in ♂ about twice as long as the body. Type, *A. tarsalis*, sp. n. Distrib., Borneo.

Atopopus tarsalis, n. sp.

Imago (dried). Body above piceous-black, with the last segment or two of the abdomen flavescens; belly flavescens. Fore-leg piceous-black, the femur to the middle piceous-brown; hinder-legs with femora piceous-brown, tibiæ flavescens, and tarsi rather deep fumatose, with the joinings and apical joint darker. Wings vitreous, with black neuration: fore-wing with the marginal area beyond the middle, and in part nearer the base, the sub-marginal area almost to the base, and a short narrow cloud upon the terminal margin by the anal angle, and the hind-wings likewise bordered round the apex and along the terminal margin, piceous-brown. Setæ piceous-black.

Long. corp., ♂, 9—10; al., 11; set. 20 mm.

Hab.: Labuan.

THALEROSPHYRUS, n. g.

Hind tibia of ♂ as long as the tarsus, whose proximal joint is about a third as long. Fore-legs damaged in the specimens examined by me. Relative lengths of the posterior tarsal joints:—intermediate tarsus, 10, 7, 5, 3, and 4; hind tarsus, 10, 7·5, 6, 3, and 4. Two caudal setæ incomplete. Type, *Th. determinatus* (in *Baëtis*), Walk. Distrib., Java and the Philippines.

PÆGNIODES, *n. g.*

Hind tibia of ♂ about twice as long as the tarsus, whose proximal joint is about one-eleventh as long as the tibia. Fore-leg of ♂ damaged in the specimens examined; in ♀ the tarsus is nearly three-quarters as long as the tibia, and its proximal joint about one-ninth as long. Relative lengths of tarsal joints:—fore-leg, ♀, 6, 13, 11, 5, and 6; intermediate, 5, 7, 7, 2, and 5; hind-leg, 5, 7, 7, 3, and 5. Two caudal setæ, in ♂ twice and two-thirds (?), in ♀ thrice and three-eighths, as long as the body. Type, *P. cupulatus* (in *Heptagenia*), Etn. Distrib., China and Tibet.

COMPSONEURIA, *n. g.*

Hind tibia of ♀ about twice and a quarter as long as the tarsus, whose proximal joint is about one-tenth as long as the tibia. Fore-tarsus in ♀ very nearly as long as the tibia. Relative lengths of tarsal joints, in ♀:—fore-leg, 18, 23, 16, 8, and 12; hind-leg, 10, 9, 5, 3, and 10 or 11. Cross-veinlets in the disc of the fore-wing very sparse, disposed in only three transverse broken series. Two caudal setæ. Type, *C. spectabilis*, *n. sp.* Distrib., Java.

Compsoneuria spectabilis, *n. sp.*

Imago, ♂ (dried). Ochraceous or pale straw-yellow, varied with fusco-piceous on the thorax. Hind-legs (the others lost) pale straw-yellow; the trochanter, median and apical band of the femur, base of tibia, and the tarsal joints very narrowly at the joinings, black-piceous. Wings vitreous, with pellucid longitudinal nervures, excepting that the costa, sub-costa, and radius towards their extremities are piceous; cross-veinlets piceous, narrowly clouded with the same colour. Last two abdominal segments pale; the others edged narrowly above with black at the tips, and with a line on each side near the spiracles, obliquely recurrent from this edging also black; the third, fourth, sixth, and seventh have, besides, a lanceolate black streak in the middle of the back produced out of the same edging: forceps and belly ochraceous.

♀ (dried) very similar, but with the body luteous instead of ochraceous.

Long. corp., ♂ ♀, 6; al., ♂, 7, ♀, 8 mm.

Hab.: Lahat (Leyden Mus.), from Mr. C. Ritsema.

RHITHROGENA, *n. g.*

Imago. Hind tibia of ♂ about twice and one-half as long as the tarsus, whose proximal joint is scarcely more than one-thirteenth as long as the tibia. Fore tarsus in ♂ nearly half as long again as the tibia, in ♀ scarcely upwards of half as long as the tibia; the proximal joint in ♂ about one-eleventh, in ♀ about one-fifteenth as long as the tibia. Relative lengths of tarsal joints:—fore-foot, ♂, 6·5, 27, 27, 18,

and 9, ♀, 4, 9·5, 8, 5, and 10; hinder feet nearly as 3, 3, 3, 2, and 7. Two caudal setæ, usually twice, or twice and a half as long as the body. Penis-lobes narrow, very slightly enlarged at the tip.

Wings of sub-imago usually unicolorous greyish, the nervures not conspicuously darker.

Nymph with seven pairs of abdominal tracheal branchiæ; *the first pair very large, ventral*, the laminae broad, slightly curved, flattened, and contiguous at their tips with one another beneath the base of the abdomen; the next five pairs lateral, their laminae deflected, so as to be almost out of sight from above; the last pair meet one another underneath the body, and their laminae are folded lengthwise: tracheae not obvious; the fasciculated fibrils are scarcely two-thirds as long as the laminae. Head much flattened, somewhat transverse: labrum distinct, small. Mandibles terminated by a single, large, acutely-triangular fang, with a smaller tooth at its inner base; the former nearly half as long as the interval between the base of the latter and the point of the molar tuberosity. First joint of the upper maxillary palpus largely dilated behind, and about half as long as the second joint, which is slightly dilated before the tip. Lateral lobes of the tongue narrower than the median lobe. Caudal setæ three, subequal to each other. Type, *Rh. semicolorata* (in *Baëtis*), Curt = *Baëtis*, Walsh, Section C. Pictet, Mon. Ephem., pl. 21, f. 1, seems to be a nymph of a *Rhithrogena*; but I think *B. lateralis*, to which he refers it, is a species of *Ecdyurus*. Distrib, Europe and N. America to Oregon.

HEPTAGENIA, Walsh (restrict.).

Imago. Hind tibia of ♂ about twice and a half as long as the tarsus, whose proximal joint is about one-eighteenth as long as the tibia. Fore-tarsus in ♂ about once and two-thirds, in ♀ about two-thirds, as long as the tibia; the proximal joint in ♂ about one-fourteenth, in ♀ about one-eleventh, as long as the tibia. Relative lengths of the tarsal joints:—fore-foot, ♂, 4, 28, 28, 18, and 7·5, ♀, 4·5, 10, 8, 3·5, and 7; hinder feet, ♂, 2·5, 4, 4, 2·5 or 2, and 8. Two caudal setæ, usually in ♂ twice, in ♀ once and a half, as long as the body. Penis-lobes rather broad and divergent from one another.

Wings of sub-imago usually of a yellowish tint, and at first almost unicolorous; in the next place the cross-veinlets become darkened; and still later, transverse fasciæ and streaks of a similar dark greyish hue are developed in the disc of the wing. The sub-imago in repose erects the wings, and stands upon all of its feet, with the setæ divergent.

Nymph with seven lateral pairs of abdominal tracheal branchiæ ; *the laminæ small*, nearly alike in form, reflected backwards and outwards, with their edges up and down ; their tracheæ indistinct ; *the fibrils abundant, and about as long as the lamina*. Head rounded and broadly flattened out ; postero-lateral angles of pronotum rectangular or obtuse ; *labrum not obvious*, a velvety fold of the palate taking its place. Mandibles terminated by two strong slender fangs, of which the outermost is the stronger, and is about as long as the interval between the base of the other and the point of the molar tuberosity. First joint of the upper maxillary palpus about two-thirds as long as the second, and rather stouter than it. Lateral lobes of the tongue broader than the median lobe. Caudal setæ three. Type, *H. flavescens*, Walsh. Distrib., Europe, N. America, Cape Colony.

ECDYURUS, Etn. (revived ; misspelt *Ecdyonurus* in Trans. Ent. Soc. Lond., 1868, p. 142, n. ; corrected in E. M. M., v, 90).

Imago. Hind tibia of ♂ about once and three-quarters as long as the tarsus, whose proximal joint is almost one-ninth as long as the tibia. Fore-tarsus in ♂ nearly, or quite, twice as long as the tibia, rarely so little as one and two-thirds as long ; in ♀ from three-quarters as long, to almost the same length, as the tibia ; the proximal joint in ♂ from nearly one-third to four-ninths, in ♀ from about one-fifth to one-seventh as long as the tibia. Relative lengths of the tarsal joints : —fore-foot, ♂, 12, 24, 22·7, 17, and 9, or 23, 31, 33·5, 23, and 17·5, or 19, 30, 28·7, 22, and 18 ; in ♀, 7, 8, 7, 4, 7, or 7, 9, 8, 5, and 8 ; hinder feet, ♂, 5, 4, 3·5, 2·5, and 6. Caudal setæ in ♂ two and a half to three times as long as the body, in ♀ about once and a half as long. Penis lobes very broad.

Wings of the sub-imago at first greyish with dark neuration, usually edged with grey ; afterwards, in most cases, dark transverse bands and fasciæ appear in the disc of the fore-wings.

Nymph with seven lateral pairs of tracheal gills, the first the smallest ; laminæ reflected obliquely outwards : with distinct tracheæ ; *the branchlets of the median trachea usually pinnately arranged* in some of the laminæ ; fibrils nearly as long as the lamina in the first three pairs, and nearly half as long as it in the others. Head rounded and broadly flattened out ; *postero—lateral angles of the pronotum prolonged backwards*. Labrum distinct, small. Mandibles with two strong slender fangs, the outermost of which is about one-third as long as the interval between the base of the other and the point of the molar tuberosity. First joint of the upper maxillary palpus about half as

long as the second, and rather stouter than it. Lateral lobes of the tongue broadly claw-shaped, with the points turned outwards, narrower than the median lobe. Three caudal setæ. Pictet, Mon. Ephem., pl. 16, f. 1—7, may be an *Ecdyurus*, but, if so, are apparently not accurate in minutæ. Type, *E. venosus*, Fab. Distrib., Europe and N. America.

EPEORUS, n. g.

Imago. Hind tibia of ♂ about twice and a half as long as the tarsus (in Colorado species twice and one-fifth), whose proximal joint is almost one-twelfth as long as the tibia (Colorado one-eleventh). Fore-tarsus in ♂ about once and one-sixth (Colorado nearly once and a half), in ♀ nearly three-quarters as long as the tibia. Relative lengths of the tarsal joints:—fore-foot, ♂, 18, 18, 15, 13, and 9 (Colorado, 32, 32, 32, 23, 10); ♀, 7·5, 8, 7·5, 5, and 8; hind-foot, ♂, 4·5, 4·5, 3·5, 2, and 6 (Colorado, 4·5, 4·5, 4·5, 3, and 7). Caudal setæ two, in ♂ about twice and three-quarters, in ♀ twice, as long as the body. Penis lobes of moderate breadth, divergent.

Wings of sub-imago greyish, or sometimes yellowish, with dark neururation, but with neither fasciæ nor streaks.

Nymph with seven pairs of lateral tracheal branchiæ on the abdomen, the fibrils scanty, not half as long as the lamina, to whose edge they stand at right angles; the laminæ decumbent, with a sub-median trachea rather irregularly branched. Head rounded, flattened. Labrum distinct, small. Mandibles terminated by a pair of short broad teeth, the outermost less than half as long as the space between the base of the other and the point of the molar tuberosity. First joint of the upper maxillary palpus almost two-thirds as long as the second, rather stouter than it, and slightly dilated. Lateral lobes of the tongue relatively large, oblong. *Median seta absent in the adolescent insect.* Hind edge of pronotum straight. Type, *E. torrentium*, n. sp. Distrib., Portugal, the Pyrenees, the Alps, and, perhaps, also Oregon, Colorado and Costa Rica. [The American species have, perhaps, rather slenderer legs than the European.]

Epeorus torrentium, n. sp.

Imago (living), ♂. Oculi above dark fuscous, darker beneath. Thorax lutescent above. Abdomen above, fusco-luteous, paler at the sides, with oblique piceous streaks from the dark tips of the segments; the usual pale dorsal spots very distinct from the second to the eighth segment; beneath, with a dark ventral stripe enlarged posteriorly in each segment, and containing four darker lines. Neururation of wings black. Fore-legs piceous, or luteo-piceous, the tarsal joinings paler, the unguis alike and sub-equal; hinder legs gamboge-yellow, with the usual bands indistinct, the tarsi blackish, with darker claws and joinings. Setæ fuliginose, darker at the base, with dark joinings.

Description of ♀ and sub-imago deferred.

Long. corp., ♂, 11, ♀, 13; al., ♂, 12, ♀, 15; set., ♂, 28—29, sub-im., 17, ♀, 22—26, sub-im., 19 mm.

Hab.: in a mill stream at Tarascon (Ariège). August and September.

My introductory caution against laying too much stress upon the admeasurements given in the descriptions of the genera should not be lost sight of. Accidents in early life, to which the legs and setæ are very liable, interfere with the dimensions in the adult insect; and some allowance must be made for exceptional peculiarities in the fore tarsus of the ♂ of certain species, all of which are not indicated here. The hind tarsus is less liable to variation.

Croydon: April, 1881.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(Continued from page 5).

3. MYDÆA, R. Desv.

Spilogaster, pt., Auctt.

Aricia, pt., Macq.

Gen. ch.—Eyes bare, contiguous, or sub-contiguous in male; arista plumose; abdomen mostly oval, and always unspotted; alulets well developed, the under scale being much longer than the upper one; anal vein not prolonged to the margin of the wing.

With legs wholly black.

1. VESPERTINA, Fall.

3. ALLOTALLA, Meig.

2. NIGRITELLA, Zett.

With legs partly pale.

4. URBANA, Meig.

9. IMPUNCTA, Fall.

5. ANGELICÆ, Scop.

indistincta, Rond.

6. TINCTA, Zett.

10. SEPARATA, Meig.

7. PAGANA, Fab.

11. FLAVEOLA, Fall.

8. NIGRICOLOR, Fall.

varians, Zett.

The species placed in this group form part of the genus *Spilogaster* of most authors, but differ from those properly belonging to that genus by having unspotted bodies. The genus *Mydæa* is closely related to *Hydrophoria*, but may be distinguished from it by the species having the abdomen usually oval and not conical, and not having the anal vein prolonged to the posterior margin of the wing.

M. NIGRITELLA, Zett.

This little black and rather rare species bears a very considerable resemblance

to the common *M. vespertina*, but differs by having the abdomen narrower and more elongated; the halteres black, not yellow; the wings clear, not blackened; the posterior tibiæ ciliated along both sides, not bare; and furnished with a single strong spine at the end, on the inner side.

M. ALLOTALLA, Meig.

This is rather an aberrant species, the generic position of which is somewhat doubtful; by the shape of the abdomen it resembles a *Hydrophoria*, but the anal vein is not prolonged to the border of the wing. It seems to be rare, or rather local.

M. URBANA, Meig.

In one variety of this common species the males have the anterior femora pale like the females, without any black colour, even at their bases.

M. ANGELICÆ, Scop.

It is almost impossible to distinguish this species from *M. urbana*, which it closely resembles, by the description of the older authors. Meigen described it as having both scutellum and abdomen ferruginous, and evidently confused it with quite a different species. Fallén, Zetterstedt, and Schiner, chiefly distinguish it from *M. urbana* by the external transverse vein of the wings being more upright than in that species; this character, however, is quite insufficient, and it remained for Rondani to point out a true characteristic difference. He noticed that in *M. angelicæ* the penultimate or third abdominal segment was crossed in the middle of the dorsum by a transverse row of strong bristles, in addition to the row on the distal margin; while in *M. urbana* the middle or disc of the same segment is without distinct bristles. Besides this character, the arista has much shorter hairs in *M. angelicæ* than in *M. urbana*; the external transverse vein is much less oblique; the fore femora in the females are partially blackened at their bases, and not wholly yellow as in *M. urbana*. Rondani says that the size of the former is rather less than that of the latter species.

This fly is decidedly rare in England. I have only seen one female, which I captured in September, 1878, at Clapham-in-Craven, Yorkshire.

Among some unarranged British *Diptera* collected many years ago, I find a single male of an apparently new species of *Mydæa*, related in some points to *M. angelicæ* and *M. urbana*. It is more elongated in shape and rather larger than either of those species; the penultimate abdominal segment is furnished both on the disc and margin with numerous long setæ, irregularly arranged; the longitudinal dorsal abdominal stripe is wider and more maculiform; and the legs have peculiarly long tarsi. Unfortunately, it is too imperfect for accurate description, the terminal joints of the antennæ being absent, as well as both the anterior legs.

M. SEPARATA, Meig.

This species closely resembles *M. impuncta*, but differs in having the basal joints of the antennæ and the palpi black, and not pale as in the latter species; the arista has also rather shorter hairs; and the eyes in the male are rather wider apart. It is rare.

M. FLAVEOLA, Fall.

This species closely resembles *Hyetodesia pallida*, but the eyes are bare and not hairy, and the arista has shorter hairs. The females of this species are not uncommon, but the males are seldom met with.

(To be continued).

LIST OF LEPIDOPTERA OBSERVED IN THE NEIGHBOURHOOD OF GALLIPOLI, TURKEY, IN 1878.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(continued from page 13.)

RHOPALOCERA.

Papilio Podalirius, L.—Tolerably common. The first specimens were observed the 18th May, flying about gardens at Bulair, and occasionally settling on the flowers of a small umbelliferous plant. At Port Baklar, about two miles from Bulair, it was noticed by Mr. J. J. Walker, R.N., of H.M.S. "Swiftsure," as early as 16th April. A female was one day seen depositing her eggs on a stunted sloe bush growing in a wild spot far away in the country, but they were usually to be found near gardens. In a waste piece of ground, just outside Gallipoli, a great quantity of scabious was in flower in August, and here *Podalirius* assembled in goodly numbers, and was easy to capture. It is not as strong on the wing as *Machaon*.

Papilio Machaon, L.—Common. A very worn individual observed on the 6th June, but it must have been out long before this date, for Mr. Walker noticed it at Port Baklar on 21st April. A fresh brood made their appearance on 23rd June, and there appeared to be a succession of broods up to the end of October, as larvæ of all sizes were noticed from end of June to 19th November. On 7th November a single larva was discovered, feeding on a particularly disagreeable smelling species of *Euphorbia*.

Thais cerisyi, B.*—Perfect insect not seen, but the larvæ were by no means uncommon. They are soft and flabby to the touch, sluggish in their movements, and semigregarious in their habits, many being found on the same plant. When not feeding they rested on the under-side of a leaf, on the mid-rib. They did not seem to be attacked either by birds or ichneumons. Their food-plant (*Aristolochia*), which has a peculiar and very pungent smell, was extremely local, only occurring in small quantities in one or two places on the sandhills, to the northward of the Bulair lines.

The following is a description of the full grown larva. Length, 1 in. 5 lin. to 1 in. 7 lin. Cylindrical, tapering towards anal extremity; ground colour canary or lemon-yellow, sometimes faintly suffused with pink; dorsal stripe rather broad, deep lead colour, enclosing a linear-shaped black spot towards the anterior part of each segment; a subdorsal dusky streak, enclosing a triangular blotch of a deeper hue, on each segment; a small dusky blotch above each clasper; spiracles minute, black, encircled by a pale ring; a subdorsal row of pink fleshy spines, the spines slightly covered with fine pale yellow bristles; a spiracular double row of similar spines, the upper series seated upon a loose skinfold, and all the spines are faintly tipped with black; under surface and claspers same as above; legs dusky; head slightly retractile, with an oval, ocellated, dusky spot on each side of face, and a triangular-shaped black spot on lower lip. A common variety of this larva was altogether lemon-yellow, with no perceptible dorsal stripe, but two minute black dots on each side of the

* In Mr. Walker's "Notes on the Butterflies of Port Baklar, Turkey" (Ent. Mo. Mag., Feb., 1879, p. 194), he says that I found the larvæ of *Thais Polyxena* "commonly at the end of June, on the Marmora side of the isthmus." This was an error on my part, for when I took the larvæ I thought they were *Polyxena*, and only discovered my mistake when the perfect insect appeared in April, 1879. I never saw *Polyxena*.

dorsal area ; a minute black dot at the base, and behind each sub-dorsal spine ; a larger black dot between each of the spines, composing the double spiracular series ; spines, spiracles, claspers, &c., the same as above. All the spines, with the exception of those on the second segment, which incline forward, incline backwards. When full grown the larva selects a dry stem or root near the surface of the ground, attaches itself by its anal extremity to a pad of silk, spins a thread around its middle, and remains for nearly three weeks before changing to a chrysalis. The chrysalis is very rigid, elongated, dull straw-colour, with a dark spiracular streak enclosing the black spiracles ; wing cases somewhat short and rounded ; dark dorsal and interrupted subdorsal streaks ; a deep impression between the base of wing and base of antenna sheath. The perfect insects began to appear at Malta the end of April, 1879, and many beautiful varieties were bred.

Aporia crataegi, L.—Very abundant. On 11th May the full grown larvæ were in great numbers on sloe and other bushes, and on the 18th of the same month the perfect insects began to appear. By the 23rd they were out in certain localities in countless swarms. On some evenings, especially when it was calm and sultry, they assembled in vast multitudes, and were to be seen at rest on grass and flower-stems, in such numbers that the stalks were quite bent down by their weight. The males far exceeded the females, although the latter were to be seen weeks after the former had disappeared. Flight comparatively heavy, and therefore easy butterflies to capture. Some of the females were very large and darkly coloured.

Pieris brassicæ, L.—Very rare in the neighbourhood of Gallipoli, and only noticed upon one or two occasions. It was, however, very abundant at the Dardanelles, where larvæ were observed in profusion up to the end of December, and at Ismid I found a larva just attaching itself to a wall as late as 2nd February, 1879, and there had been plenty of frost and snow for some weeks previous.

Pieris rapæ, L.—Common throughout the whole district, though never very abundant. In some specimens taken the black spots were entirely absent. The larvæ were tolerably plentiful in October and November on *Cruciferae*.

Pieris napi, L.—Rare ; only one or two examples noticed.

Pieris Daplidice, L.—Common throughout the district ; and there was evidently a succession of broods from April to October. A strong, quick-flying butterfly, and found in almost all localities, although, perhaps, preferring waste places by roadsides, where a variety of herbage flourished. Females were observed on several occasions depositing their eggs on *Cruciferae*. On 3rd August, I found some half-grown larvæ in the valley of Ak-y-lar, but did not rear any of them, for on the 5th August I went to Constantinople for a week, leaving the larvæ in charge of my servant, and upon my return I found he had neglected them, and they had perished. On 17th of the same month, many more larvæ were seen at Besika Bay, only they were too small to take ; but on the 21st October, at Artaki, I discovered many larvæ, from the tiny individual just hatched to those just preparing to pupate, and continued to find them from this date up to the middle of November. These larvæ were easily detected, as their yellow dorsal and sub-dorsal stripes made them very conspicuous, especially early in the morning, when their food-plants were damp and bright with dew. A few of the perfect insects emerged the end of November, and

of the remainder some appeared at Malta in March and April, and the rest in England in May and June, 1879. The larvæ were very subject to the attacks of a fly (sp. ?); those so attacked changed to healthy-looking chrysalids, and remained so throughout the winter, but at the beginning of March the affected chrysalids turned a deep brick-red colour, and in a few days disclosed a fly.*

The following is a description of the full-grown larva:—Length, 1 in. to 1 in. 2 lin.; cylindrical, very slightly pubescent; lead colour, thickly irrorated with minute black dots, placed in pairs upon the dorsal region, in fives between the sub-dorsal and spiracular streaks, and irregularly below; a narrow, yellow, sub-dorsal and spiracular stripe, much brighter at the segmental divisions; head bluish or bluish-green, with black dots and a yellow spot on each side of the face; legs and pro-legs paler than the upper surface, the latter with a yellow spot at their base. Chrysalis ashy-brown, with small black spots, and faint yellowish sub-dorsal and spiracular streaks; wing-cases with a dark central shade, and the margins and sheath of proboscis yellowish. Some hours before the perfect insect appears the black wing-spots can be distinctly seen through the sheath.

Anthocharis Belia, Cr.—Common. First observed 11th May; another brood in July. A quick-flying insect, and occurring chiefly in rough waste places. The females were observed once or twice depositing their eggs on a dwarfed species of *Crucifera*, but although I subsequently examined the plants, and beat them, I failed to discover the larvæ.

Anthocharis cardamines, L.—Very rare. I only observed one specimen, a male, which was captured on the sand-hills near Bulair lines, on 12th May.

Leucophasia sinapis, L., var. *lathyri*, Hb.—Not uncommon in some localities. A delicate weak-flying butterfly.

Colias Edusa, F.—Very common from May to September, and some of the specimens were remarkably bright. The var. *Helice* was by no means scarce, and I obtained several fine examples.

Rhodocera rhamni, L.—Rare; a few specimens observed, but only one, a ♀, captured.

Rhodocera Cleopatra, L.—Apparently very rare, as only one specimen, a ♂, was observed on 13th June flying across the Ak-y-lar valley. Upon looking over a small collection of butterflies made by a midshipman of H.M.S. "Agincourt," I noticed a single male, and was informed that it was captured close to Gallipoli.

Thecla ilicis, Esp.—Very abundant. The first were observed on the 29th May, and by the 6th June it was out in prodigious numbers, and proved quite a pest, for one could not strike at another species without enclosing five or six of them at the same time. They were most plentiful amongst scattered bushes of stunted *Ilex*, where they were fond of collecting upon the heads of a sweet-smelling umbel, or upon the pretty purple flowers of the gum cistus. These Turkish specimens appear to belong to a slightly smaller and darker race than those from central Europe, and out of the large number captured there was not a single specimen with the orange blotch on the fore-wings.

My friend, Mr. G. C. Bignell, of Plymouth, to whom I sent some of these chrysalids, bred an ichneumon (*Anomalon xanthopus*) from them.

Polyommatus Thersamon, Esp.—Common, and there seemed to be several broods during the summer, for it was noticed from the beginning of June up to the 28th November. This species was very partial to the flowers of the field scabious, and the males were much more plentiful than the females. They were difficult to obtain in perfect condition, for, being always ready to give battle to any passing insect, they soon became ragged and torn. Some examples taken at Artaki, on the Asiatic side of the sea of Marmora, at the beginning of October, were slightly smaller and paler than those taken in Turkey.

Polyommatus Alciphron, Rott., var. *Gordius*, Sulz.—Only took a single example, a male, as it was sitting enjoying the flowers of the peppermint.

Polyommatus Dorilis, Hufn.—Appeared to be rare, as I only saw and captured a pair.

Polyommatus phlœas, L.—Abundant, and a succession of broods throughout the summer. On 17th of June, we visited the island of Pachalimon—one of a group in the sea of Marmora—and, as we stopped there for some hours, I landed to look for butterflies, hoping to find some species that I had not noticed on the mainland, but nothing fresh turned up, the only thing of interest being the immense swarms of *phlœas*. It was a terribly hot day, and the butterflies had collected in shady spots in the ravines, where the sun could not penetrate. A blow with my beating stick brought them out of the bushes in hundreds, and I often had more than a dozen in my net at a time. These examples were so very dark, that at first I thought I had a new species, but they proved to be the variety *Eleus*, of Fabricius.

Lycæna bætica, L.—Common, especially wherever wild vetches grew. There were several broods during the summer, and I noticed it throughout November and December, and up to 4th January, 1879.

Lycæna Telicanus, Lang.—Local, but common in certain places among *Lythrum salicaria*, L., vetches, and other papilionaceous plants.

Lycæna, n. sp.?—One specimen, above very like *Telicanus*, but totally distinct beneath. I could see nothing like it in the British Museum.

Lycæna Argiades, Pall.—Rare and local, and was difficult to obtain in perfect condition.

Lycæna Pylaon, F. de W.—Rare, only two or three examples.

Lycæna Bavius, Ev.—A single female.

Lycæna Astrarche, Bgstr. (*Agestis*, Hb.).—Common.

Lycæna Icarus, Rott.—Abundant. Turkish examples vary a good deal both in size and brilliancy of colour.

Lycæna Amanda, Schn.—This fine species was somewhat rare and local, and the males were difficult to obtain, as they were very quick and strong on the wing.

Lycæna Admetus, Esp.—Not uncommon, but very local.

Lycæna Argiolus, L.—Common, and double-brooded. I fancy the larvæ of the second brood feed upon the flowers and tender shoots of a species of *Berberis*, for the butterflies were to be seen continually flying about the shrub.

(To be continued).

NOTE ON THE EGG, AND SOME PECULIARITY OF STRUCTURE IN
THE LARVA, OF *HIMERA PENNARIA*.

BY THE REV. J. HELLINS, M.A.

Early last December Mr. D'Urban put into my hands an ash twig gathered by a laudable butcher's-boy, whose attention had been caught by the appearance of a batch of eggs near the tip. I ought at once to have known to what species these eggs belonged, but, luckily, did not recognise them; otherwise, probably, I should not have cared for them, and should have missed making an observation which, I think, deserves some notice.

There were just 151 eggs, laid in nine rows, parallel with the stem of the twig, in most beautifully compact and regular order, the whole mass measuring rather more than $\frac{3}{8}$ inch in length, and about $\frac{1}{8}$ in width, and firmly stuck together, and to the bark of the twig, by an abundant supply of shining light red cement. The shape of the egg is cylindrical, set upright on end, about $\frac{3}{16}$ inch in height, and $\frac{1}{8}$ inch in transverse measurement; the top is rounded; sometimes the cylindrical shape becomes somewhat hexagonal, from being squeezed in so closely on all sides, the shell is glossy, with a slight roughness round the top; the colour dull pale green; towards spring this changes to a pale reddish-brown, and again four or five days before the larva emerges to a blackish hue. The batch of empty egg-shells looks like a piece of Lilliputian honeycomb.

The first larva was hatched on April 13th, and the last that came out about a fortnight later; some died in the egg; I think, however, that the larvæ at large were delayed this year by the cold nights, and that none, probably, were hatched till the end of April: at least, the larvæ I have captured have been quite three weeks behind my larvæ reared indoors.

The young larva is about $\frac{1}{8}$ inch in length, in colour dull black, except the anal flap which is pale brownish, as also are the legs, tipped, however, with black; the usual spots palish brown with raised central black dot emitting a short, finely-knobbed bristle; as the larva feeds, the colour grows paler, becoming a sort of dark olive, with pale lines: one, which I set apart for observation, moulted for the first time just a fortnight after hatching, and I noted that at this first moult there

appeared the two projecting warts on the twelfth segment, which (with other circumstances) enabled me to recognise the species—but I presently also noted another change which puzzled me greatly; I took these little larvæ to be *H. pennaria*—a species in which I had never before seen more than ten legs, nor had any one described it with more than ten legs, but now there appeared *a pair of undeveloped ventral legs on the ninth segment*; as I have inferred, I certainly did not see these legs previous to the moult, nor do I think they were then to be seen, but what follows makes me wish I had made quite certain: this pair of legs continues through the second moult, becomes smaller after the third moult, and *with the fourth moult disappears*, the site being marked by a minute eminence, and afterwards by a *little horny depressed plate*; and the larva to all appearance has but the ten legs with which it has always been credited. At their fullest development these extra legs are very tiny, still they are plainly enough to be seen, and are more like the rounded ventral legs of a *Noctua* than the spreading, clinging legs of a large Geometer; they have a black ring round them midway, and a circle of tiny black horny points where the usual circlet of hooks is found.

Both Mr. Buckler and Dr. T. A. Chapman have confirmed my observation from examination of examples which I have sent them, and we are now examining as many species of the large Geometrous larvæ as we can obtain, but so far without finding any evidence of a similar absorption or suppression of a leg once developed. In other species, as, for instance, in *Anisopteryx æscularia* (Ent. Mo. Mag., vol. xiv, p. 113), we find such legs developed after a moult or two, but continuing to the last in the same proportionate size; on the other hand, many *Noctuæ* when hatched have only two out of their four pairs of ventral legs of full size, but the other two by degrees grow larger, and at last take their full share in walking and holding fast.

But in this case a pair of legs is developed, is of no use at any time, and, by and by, is again suppressed; the only thing like it at all, which I can now call to mind, is the appearance of two horns behind the head of the newly-hatched larva of *Cerura vinula*, which by degrees are absorbed and disappear; still, this does not seem so strange as the appearance and subsequent disappearance of even an useless limb.

THYREOPHORA ANTIPODUM, NEW SPECIES OF *DIPTERA*.

BY BARON C. R. OSTEN-SACKEN.

In the Ent. Mo. Mag., vol. xv, p. 43, I had occasion to mention the genus *Thyreophora*, in connection with the subject of luminous *Diptera*. The singular and very rare fly, *Thyreophora cynophila*, was believed to have a luminous head. But to the quotations which I gave at that time I should have added that of Robineau-Desvoidy, Ann. Soc. Ent. Fr., 1849, Bullet., p. v, who says that his experiments did *not* confirm Count St. Fargeau's statement on that subject.

Independently of its supposed luminosity, *Thyreophora* is a fly remarkable for its structure. It has a largely developed scutellum, prolonged almost like a horn, truncate at the tip, where two bristles are inserted. Schiner forms for this genus a separate group, intermediate between the *Scatophaginæ* and *Helomyzinæ*. The colour of *T. cynophila* is also striking and unusual among the relationship to which it belongs, being bright metallic-blue with a reddish-yellow head. The colour of the other species, *T. furcata*, is more dull. Both flies are rare; the specimens of *T. cynophila* existing in European collections can almost be counted. I am not aware that the third species, *T. anthropophaga*, R.-Desvoidy, has been recorded anywhere since his time.

Not long ago, in looking over the store-boxes containing duplicates and unnamed specimens, in my friend, M. Bigot's, collection, I had the good fortune to discover two specimens of a *Thyreophora*, labelled "Tasmania." With M. Bigot's permission, I described them on the spot, as the first instance of the genus being found outside of Europe. The species is remarkable for a row of spine-like bristles along the costal margin of the wing, a character foreign to its European congeners, and justifying its assumed relationship to *Helomyza*.

THYREOPHORA ANTIPODUM, *n. sp.*

♂. Brownish-ferruginous; antennæ and abdomen black; wings sub-hyaline, unicolorous; costal margin provided with a series of spine-like bristles (like those of *Helomyza*). Length, 4—5 mm.

In the generic characters this species agrees with *T. cynophila*; the eyes are larger, as compared to the size of the head; the third joint of the antennæ is less rounded, more oblong; the venation is the same, only the section of the costal vein anterior to the end of the first vein is straight (and not arcuated as in ♂ *T. cynophila*). But a more important difference consists in the row of spine-like bristles inserted along the costa, and resembling those which characterize most *Helomyzidæ*. Head and thorax brownish-ferruginous; third joint of antennæ and ocellar spot black. Scutellum of the same truncate-triangular shape as in *T. cynophila*, but less hairy. Abdomen black, hairy, shining. Legs brownish-ferruginous, more or less dark (in one of the specimens the hind legs are dark brown with a slight metallic reflection). Tarsi brown at the end. Wings uniformly sub-hyaline; veins brownish-yellow.

Hab.: Tasmania; two male specimens (M. Bigot's collection, in Paris).

Heidelberg: June, 1881.

ON TWO NEW *PANORPIDÆ* FROM WESTERN NORTH AMERICA.

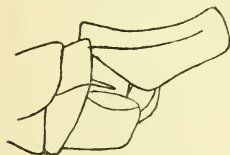
BY R. McLACHLAN, F.R.S., &c.

The two species described below were lately received in a collection formed by Mr. H. K. Morrison, of Morganton, North Carolina.

BITTACUS CHLOROSTIGMA, *n. sp.*

♂. Shining reddish-piceous (the head and thorax reddish-testaceous in less adult individuals); apical abdominal segments darker, sometimes nearly blackish. Antennæ black, with very short concolorous pubescence; the first two joints of the ground colour. Rostrum blackish; the superior dilated portion of the ground colour; palpi clothed with black hairs. A black spot on the head between the ocelli. Thorax, and base of abdomen beneath, with scattered black spinose hairs, of which three on each side of the front of the pronotum are the most conspicuous. Legs reddish-piceous; a black ring at the apex of the femora and tibiæ; spinose hairs few, short and black.

Superior abdominal appendages fully as long as the terminal and penultimate segments together, reddish, but darker (sometimes blackish) at the tips; irregularly oblong, broad, the superior margin elevated into an angle at the extreme base, but afterwards excised to the apex, which is very obtuse and nearly truncate, the inferior margin gradually rounded and dilated; exteriorly the edges are thickened, and there is a slight keel from base to apex parallel with the upper edge; interiorly the appendages are concave, the edges equally thickened, and there is a broad triangular inner tooth above the most dilated portion of the lower edge. Penis reddish-testaceous, recurved in a nearly semicircular manner, flattened, with a median longitudinal sulcus. Internally, between the superior appendages, is a short straight hairy process, gradually dilated to the very obliquely truncate apex. On each side, immediately above the inferior appendage, is a short, straight, cylindrical, hairy (apparently non-articulate) process.



Wings long and very narrow, scarcely dilated: vitreous (possibly with the slightest tinge in very adult individuals). Pterostigma large, *conspicuously greenish-yellow*. Neuration black (excepting the pterostigmatic vein and its two nervules); apical transverse nervules few.

♀ unknown.

Length of body, 25—26 mm. Expanse, 51—57 mm. Length of anterior wing, 25—28 mm. Greatest breadth of anterior wing, 4—4½ mm. Length of superior appendages, 2¾ mm.

South California. I have examined eight ♂.

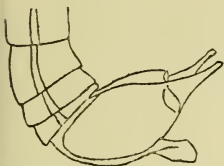
This species, which is conspicuous by its pale greenish-yellow pterostigma, has the greatest expanse of wing of all the known North American forms; at the same time the wings are remarkably narrow, and in this differ from all species from the Eastern States. It is a fine addition to the N. American fauna.

The figure represents a side view of the end of the abdomen (with the appendages) of the ♂ in outline.

PANORPODES OREGONENSIS, *n. sp.*

♂. Very pale yellowish-testaceous, the abdomen (excepting at apex) fuscous above; ocelli shining blackish; eyes deep black. Antennæ dusky towards the tips. Legs concolorous; the tips of the tibiæ and of the tarsal joints slightly blackish; spinose hairs of tibiæ and tarsi few, short and black; pulvilli large, rounded, black. Maxillary palpi having the 3rd and 4th joints conical, not concave within. *Genæ produced downward into a broad triangular tooth*, on each side of the face below the eyes: mentum with a slight triangular tooth on each side.

Cheliferous segment oval, yellowish; claws short and stout, testaceous at the tips. Appendages, viewed laterally, prominent, thickened and out-turned at the tips: viewed in front they consist of a long band-like piece, slightly dilated at the apex, which is provided with two out-turned slightly foliaceous branches (the true appendages), the whole structure scarcely extending to the base of the claws. The whole



segment is finely pubescent.

Wings wholly very pale shining flavescent, transparent, without markings, the pterostigmatal region slightly darker: neuration very pale, the transverse nervules conspicuously whitish if the wings be held against the light: sub-costa terminating about the middle of the costa (before the pterostigma) in both pairs.

♀ unknown.

Length of body, 7—8 mm. Expanse, 20—24 mm.

Mt. Hood, Northern Oregon. I have nine ♂ before me.

The genus *Panorpoidea* was established by me in the Trans. Ent. Soc. Lond., 1875, p. 188, for an insect (*P. paradoxa*) from Japan, which, while possessing the general form of *Panorpa*, differs in the rostrum being short and triangular, and in the penultimate and ante-penultimate abdominal segments in the ♂ not being modified and elongate, but narrow and of the form of the ordinary segments, the cheliferous segment closely sessile; also in the form of the maxillary palpi, simple tarsal claws, and unicolorous pale wings.

The interesting little North American insect above described possesses so many points in common with that from Japan, that, for the present, it may be located in the same genus; there is a striking similarity in colour in the two species. The following structural discrepancies exist:—

1. The sub-costa in *P. paradoxa* extends into the pterostigmatic region in the anterior-wings. (This may certainly be considered of specific importance only).
2. The rostrum in *P. paradoxa* is longer than in *P. oregonensis* (hence the latter is still more divergent from the ordinary condition in *Panorpa*).

3. The maxillary palpi in *P. paradoxa* have the 3rd and 4th joints much dilated, and concave within (as if collapsed), instead of cylindrically conical.
4. There is no trace in *P. paradoxa* (nor in any other species of the Family known to me) of the triangular production of the genæ seen in *P. oregonensis* (on the other hand, the teeth on the mentum of *P. paradoxa*, ♂,* are very large, although not noticed in my original description).

On these points it may ultimately be considered necessary to transfer *P. oregonensis* to a distinct genus.

The figure represents the apex of the abdomen of the ♂ of *P. oregonensis* viewed from the side.

N.B.—Although the true genus *Panorpa* is so abundantly represented in the eastern United States, I have never seen a specimen from west of the Rocky Mountains, and know not if any exist in American collections.

Lewisham, London: *May*, 1881.

Lepidoptera at Barnwell Wold.—The first few days of the present month I spent, in company with the Rev. T. W. Daltry, M.A., of Madeley, collecting in that once famous locality, Barnwell Wold. We were not very successful, for, although the weather was everything we could desire, insects, or rather good species, were not numerous. Probably we were a week or two too early. The sloe bushes produced larvæ of *Thecla betulæ* in tolerable numbers, but rather small; and full-fed ones of *Thecla pruni* were not scarce the first day or two, but could not be found on our last attempt at beating for them. Other larvæ included *Trichiura cratægi*, *Pæcilocampa populi* not uncommon on oak trunks, *Eriogaster lanestris*, *Diloba cæruleocephala*, *Himera pennaria*, *Agriopis aprilina*, *Amphipyra pyramidea*, &c., &c.; whilst both larvæ and pupæ of *Pterophorus galactodactylus* were plentiful on the under-side of the burdock leaves. Of imagos *Nemeobius Lucina* was very common flying about hawthorn blossom, &c., and some seven or eight other species of the commoner butterflies also occurred. We searched for, but saw nothing of *Hesperia Paniscus*, probably it was not yet out. And we were of course too early for *Lycæna Arion*, even if it could still be found in its old locality, but Mr. John Bright an old collector with whom we were staying, seemed to have little hope it would ever again turn up in Barnwell Wold, although formerly he took it there in large numbers. *Cherocampa elpenor* occurred about the sugared trees, *Nola cristulalis* on oak trunks, *Corycia temerata* in abundance and in beautiful condition by beating, along with *Ligdia adustata*, *Emmelesia albulata*, *Eupithecia exigua*, *Melanthia albicillata*, *Coremia ferrugata*, *Cidaria corylata* and *russata* (both species plentiful

* I have since received the ♀ of *P. paradoxa*. The teeth on the mentum are small; the apical two segments of the abdomen are very short; the wings are slightly dusky at the tips.

and variable), *Cidaria silaceata*, *Anaitis plagiata*, *Herminia grisealis*, and *Botys lancealis* in greater or less numbers. Mr. Daltry too, netted a very beautiful variety of *Lomaspilis marginata*. Of *Noctua*, the little *Heliodes arbuti* flew very freely in the sun, and *Euclidia ni* and *glyphica* were also common. At sugar *Aplecta herbida* in fine condition was getting well out, though the date was rather early for it; *Noctua c-nigrum*, *Apamea unanims*, *Thyatira batis* and other common species, but nothing of any rarity was taken.—GEO. T. PORRITT, Highroyd House, Huddersfield: June 9th, 1881.

Abundance of larvæ of Charæas graminis.—We observe from a local paper that great commotion prevails in Clitheroe, and the district surrounding the famous Pendle Hill, in consequence of the arrival of a large quantity of caterpillars, which occupy the land from Wiswell to Mearley, near Pendle Hill, a distance of about three miles. They travel together in thousands at a good speed, and devastate the land over which they pass to an alarming extent. The inmates of a roadside inn are kept continually at work brushing them out of the house. The road is almost black with the larvæ, whose advent is considered mysterious, numbers of people continually going to view them, and numbers of larvæ being exhibited in shop windows. The caterpillars seem also to be abundant on some of the adjoining moors. We have seen specimens, and find that they are the larvæ of *Charæas graminis*, the well known "Antler" moth, which was very abundant last year in Tatton Park, Knutsford. Their ravages in Sweden and our own Lake district have often been recorded.—EDS.

Eupithecia consignata at Box Hill.—I was somewhat surprised to take at Box Hill, on the 25th May, a specimen of *Eupithecia consignata*, which I disturbed from some bushes near the Burford Bridge Inn. The specimen is a ♀, and has laid a few eggs. I am induced to send this notice, as so few localities appear to be known for this species.—A. H. JONES, Shrublands, Eltham: June 10th, 1881.

Notes on the genus Eustra in Japan.—Of the curious Family *Ozæninæ*, there is only one species recorded from Japan, and in this one Mr. Bates was much interested when writing his first memoir on the *Geodephaga* of these islands. I met with it again yesterday, and a record of its habits may increase the interest regarding it.

This little beetle hibernates under flatish stones, 14 or 18 inches in diameter, choosing those for its retreat which are partially embedded in the soil, and well hidden away in the shelter of shady thickets. It is never found under loose stones, nor under those out in the open, exposed to the rays of the sun. *Eustra* is gregarious, associating in little groups of three, five, or eight, and, when the stone is overturned, the insects are found close together, adhering to the surface of it, never on the earth. Their mode of running and habit of life remind one of *Crepidogaster* or one of the crepitating *Carabidæ*; but anatomists who study the group place them far away from the *Brachyininæ*. *Eustra plagiata*, Schmidt-Goebel, occurs in Burma, and Mr. Bates, after a careful reading of the description, refers the present species to it; but I should very much like to place Japanese specimens side by side with an Indian type for comparison, and will gladly send examples to any Entomologist who could thus identify them. Can any one tell me where the type specimen is? I have written here that *Eustra* "hibernates," but during the last two weeks I have taken many *Geodephaga*, including *Carabus Dehaani*, under stones loose on

the surface of the soil, for hibernation here is very different to hibernation in Yokohama, where the severe winter drives everything deep into the earth. Nagasaki is protected on all sides by hills, and is perhaps the warmest nook in all Kiushiu, and during the last ten days I have taken *Adoretus*, *Chalcophora* and *Mesosa* clinging to a species of *Celtis*, and this morning a man brought me a dozen fine fresh specimens of *Batocera* in a basket. Here *Ophionea cyanocephala* is abundant, but nowhere else have I seen it in Japan, and other subtropical species are also confined to this district, and I do not wonder in finding *Eustra* associated with them; but it would be a matter of surprise if it occurred in the north, where the winter is long and severe. It was April before I obtained a specimen of *Carabus* in Yokohama.—GEORGE LEWIS, Nagasaki: 26th February, 1881.

Coleoptera, &c., near Hastings.—On the 27th May last, I was fortunate enough to meet with a specimen of *Anthrribus albinus* in a sand pit here. A few days before this I had picked up a specimen of *Cænopsis fissirostris* in another sand pit. In the latter pit we have found, at various times, plenty of *Pselaphus Heisii*, *Bryaxis fossulata*, *Cytilus varius*, *Orobites cyaneus*, *Lasia globosa*, &c., and occasional specimens of *Pristonychus subcyaneus*, *Cychnus rostratus*, *Trox scaber*, *Plinthus caliginosus*, *Tanymechus palliatus*, *Chrysomela staphylea*, *C. didymata*, &c. Of Hemiptera, we have found there abundance of *Sehirus biguttatus*, a few *Aradus depressus*, and an occasional specimen of *Podops inunctus* and *Aneurys laevis*, and last, but not least, the two specimens of *Bothynotus pilosus* already recorded.—E. N. BLOMFELD, Guestling Rectory: June, 1881.

Notes on Coleoptera taken near Hastings.—Last September, I took on a mud-flat at Darvel's Hole, near Battle, a *Tachyusa* I could not make out. I sent it to Dr. Power, who has kindly examined it and determined it to be *T. coarctata*, a species introduced by him as British; and he thus remarks upon it: "*Tachyusa coarctata* is most interesting to me, for I imagined that two in my collection were its sole representatives."

I have several times taken *Notiophilus quadripunctatus* under *Calluna*; there seems to be much irregularity in the position of the four punctures from which it takes its name. These are in some specimens much farther apart than in others, and even in the same insect their position is sometimes different on the two sides, while one specimen I have has a point altogether deficient on one side.

At Battle I have lately taken *Conipora orbiculata* by sweeping, and *Euplectrus nanus* with *Phlæocharis subtilissima* in dead oak twigs; and at Hollington *Scydmanus denticornis* in moss. From Battle some of my pupils have brought in several specimens of *Anchomenus livens*. Several collections made in this neighbourhood have recently passed through my hands; they contained, amongst other things, *Euryporus picipes* and *Acidota cruentata* taken by Mr. S. Hume, and *Ocypus fuscatus* and *Megacronus cingulatus* by Mr. W. Bennett.—E. A. BUTLER, Hastings: June 13th, 1881.

Cicada montana.—A specimen of *Cicada montana* has been recently taken in the larva state by Mr. George Tate, in the New Forest. The perfect insect emerged a few days ago.—B. PIFFARD, Lyndhurst: June 16th, 1881.

The Hemiptera of Finland.—In the “Meddel. af Soc. pro Fauna et Flora fennica,” 7, 1881, pp. 1—109, under the title “Enumeratio Hemipterorum Gymnoceratorum Fennicæ,” Dr. John Sahlberg has a List of the *Hemiptera Gymnocerata* of Finland, which, primarily interesting in that country on account of the localities in which the insects have been found there, is of wider importance as showing the prevalence so far of species otherwise known in Europe, and affording means of learning their geographical and climatal range. Especially useful, therefore, is the following summary, derived from recent sources, of the number of species of *Gymnocerata* inhabiting certain regions of Europe.

Finland	360 species	Britain	390 species
Sweden	350 ”	Alsace and Lorraine	492 ”
Norway	185 ”	Belgium	337 ”
Denmark	280 ”	To which may be added, <i>sec.</i> Snellen van Vollenhoven	
Livonia	304 ”	Holland.....	263 species
Moscow Govt.....	213 ”		

These numbers are not absolute, because in each region other species will doubtless be yet discovered, and some of the reputed species may possibly merge into varieties, but yet the totals are sufficiently approximate to reality to enable comparison to be made. As between Finland and Britain the greater part of the species are identical, but each country has some not found in the other; for example, Finland, with an apparently less total than Britain, has 15 species of *Aradus*, while Britain has but 4. One new species is described, *Salda lapponica*, allied to *S. c-album*, Fieb., and *S. palustris*, Doug. I note some of the more striking items in the paper.

As to the nomenclature of genera:—*Kleidocerus* is retained although the genus was not characterized under this name. *Acalypta*, which has been incorrectly revived by some, is again deposed in favour of *Orthostira*. *Apocreminus*, merged into *Psallus* by Reuter, is again separated. *Halticus* is retained notwithstanding the prior use of *Haltica*. *Microphysa* is adopted instead of *Zygonotus*, although the characters of the former are derived from the ♀ only and do not at all apply to the ♂, while the latter includes the characters of both sexes. *Cryptostemma*, a pre-occupied name, is revived instead of *Dipsocoris*.

As to the species:—The name *Scolopostethus ericetorum*, Leth., is resumed *vice* *S. decoratus*, Reut. *S. pilosus*, Reut., is put as = *S. affinis*, Fieb., Thoms. *Salda fucicola*, J. Sahlb., and *S. pilosella*, Thoms., are retained as distinct species. *S. c-album* is maintained *vice* the older name *stellata*, Curt., and *S. vestita*, Doug. (following Reuter), is given as the macropterous form of that species.

In a previous part of the same journal (5, 1880), Dr. O. M. Reuter gives a list of the *Hemiptera* of the regions of Åbo and Åland only, the *Gymnocerata* numbering 135 species (pp. 160—193). *Sehirus luctuosus*, Muls. and Rey, is enumerated as = *morio*, Fall., Fab., Sahlb., *nec.* Linn.: this should be a hint to us to see if our *morio* be the true species, or if we have both of them in Britain.* Under some genera

* The differential characters of *Sehirus luctuosus* are thus given by Mulsant and Rey (“*Punaises de France, Pentatomides*,” p. 54, 1866). “*S. luctuosus*, often confounded with *S. morio*, is distinguished from it by its smaller size; its anterior tibiae armed with only 9—11 spines on the anterior edge, up to the exterior half of the anterior margin (in *morio* 11—13); the anterior margin of each side of the prosternum generally more constantly and sensibly raised and arcuate in its inner half; the pronotum punctured almost as strongly on the posterior portion as on the rest of its surface; the thighs more angular at the extremity; the membrane of the elytra

useful critical remarks and diagnostic comparative characters of species are given, in the author's usual lucid manner. Then follows a list of the *Homoptera*, 133 species (pp. 194—236), including some that are new. This paper, as well as that of Dr. Sahlberg, is especially deserving of the attention of British Hemipterists, the fauna of Finland and Britain being very similar.

It is a matter of regret that in both these articles, as also in other works of greater extent treating of different orders of insects, and by other modern authors, the faulty orthography of many generic names is retained. Here, among many others similar, is *Eusarcoris* for *Eusarcocoris*; *Temnostethus* for *Tmetostethus*; *Piezostethus* for *Piestostethus* (both very bad examples of derivation); and names into which, as a compound, the Greek word *SOMA* enters, which are mostly (not always) made neuter if the termination be in *SOMA*, yet (rightly) masculine if it be in *SOMUS*. The same remark applies to names into the composition of which *DEMAS* enters, the terminal *DEMA* being deemed to make the compound word neuter, but if it be *DEMUS* then masculine. But I refer to the conclusive remarks on this subject, by a classical authority, in the *Ent. Mo. Mag.*, vol. iv, pp. 259 and 280. The perpetuation of such and other irregularities, to call them by a mild designation, gives force to the reproach of a philologist once addressed to an entomologist:—"You naturalists coin most extraordinary names, sometimes by mere fanciful invention, involution, or anagram, and yet you treat the results, which belong to no language, as if they were Latin; and sometimes, when you profess to derive them from the Greek, you so mangle or misuse the words that your results indicate in their authors a want of full perception of the principles or rules of the Greek and Latin languages; and in preserving the erroneous concoctions you show a blind conservatism." Some of these names are incurable and I suppose must be endured, but others might be easily amended by general consent and practice. Gemminger and Harold, in their works, have set an excellent example in correcting the orthography of generic names of *Coleoptera*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 18th April, 1881.

Notes on Spring Hymenoptera in 1881.—Although the Aculeate *Hymenoptera* have been generally scarce this spring, I have obtained 2 species which I think are worthy of notice. The 1st, *Andrena lapponica*, I was fortunate enough to meet with near Hastings, in April, and secured a few specimens of the ♀, all flying at swallow blossoms, and so like *Trimmerana*, as to be difficult to distinguish from it until examined at home. The sculpture of the anal segment above is a good character, in *Trimmerana* it is simply punctured, in *lapponica* the centre is triangularly raised. I was also pleased to see in the collection of Mr. F. Collett, of St. Leonards, the ♀ of *Andrena fasciata*, Wesmael, generally known on the Continent by the name of *extricata*, Smith; this name has been given to it in error, as Smith's *extricata* is simply *fulvicrus* faded, and he did not know the true *fasciata*,

smoky-white, that is, more or less sooty (couleur de suie); the postepisternum marked near the odorific regions with a score of points, partly disposed in two irregular rows" (in *morio* 1½ in one irregular row). It is further said that "the colour of the antennæ varies; sometimes the 1st joint is partially or wholly of the same colour as the 2nd (fauve), and often the base of the 3rd and 4th are testaceous red (roux fauve)." The distinguishing characteristics indicated are slight and have mostly an element of "more or less," yet they may be sufficient to constitute a distinct species.

S. luctuosus is quoted by Mulsant and Rey as = *Cimex morio*, Fab., Wolff.; *Pentatomus morio*, Latr., Lepell., and Serv.; *Cydinus morio*, Fab., Fall., Burm., Ramb., Gerski, and Flor.; *Sehirus morio*, Amy. and Serv. *partim*, Fieb. (nec Linn.).—J. W. D.

Wesm., as a British species. I have had ♂ specimens of this very distinct species in my collection for some time, but did not bring them forward till I could get the ♀ also. Mr. F. Collett kindly took me to the spot where he had taken the insects, and I had the pleasure of taking a ♂ and a ♀ myself within 2 or 3 yards of each other. I hope in a coming No. to describe this addition to our list. It appears in April at the same time as *fulvicrus*. I have also received several males from Canterbury, taken by my brother this spring, but he failed to obtain the ♀, and I took a ♂ at Tunbridge Wells myself, in 1877. The white hairs of the face in both sexes distinguish it from *fulvicrus*.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: 9th June, 1881.

Hypopus parasitic on Ants.—On April 16th, I discovered a curious *Acarus* parasitic on the abdomen and antennæ of *Myrmica ruginodis*. The Ants had made a small nest under the dry excreta of a cow, in a meadow about three miles from Exeter; through the kindness of Mr. McLachlan specimens of the Ants with the *Acarus* attached have been submitted to Mr. A. D. Michael, who says that the life-history is not known, and that the form in which we know it is but a stage in its life, but what stage is a very doubtful matter; he says that he is trying to clear it up, but it is extremely difficult, the probability is that it is only parasitic in the hypopial stage, and it is more than probable that it is not confined to Ants.

He says also that these minute creatures are amply provided with suckers on their ventral surface by which they adhere to the most polished chitinous surfaces, and they lay hold of any insect of a suitable nature which passes them.

The *Hypopus* is covered with a kind of carapace which is somewhat truncated in front, the posterior portion being drawn out into a tail-like process, something after the manner of the carapace of the king-crab (*Limulus*). Under the lens it has a shining pearly lustre, tinged with purple. Should any Hymenopterist meet with any of these *Hypopi*, they would, I have no doubt, prove very acceptable to Mr. Michael in clearing up the history of this curious creature.—EDWARD PARFITT, Exeter: June, 1881.

The generic term Degeeria.—My note appended to Mr. Meade's remarks on the double use of the term *Degeeria*, published in the last No. of this Magazine (p. 19), conveys a false impression. Rondani proposed the term *Entomobrya* for Nicolet's genus *Degeeria*, not for Meigen's. At first I rightly construed his meaning, but upon referring to Marschall's "Nomenclator Zoologicus" (1873), found *Entomobrya* placed there amongst the *Diptera*. Those, therefore, who consider that Nicolet's term *Degeeria* cannot remain in use, should employ *Entomobrya*. It would have been better, however, if Rondani had simply called attention to the prior existence of "*Degeeria*" amongst the *Diptera*, leaving it to some worker at *Thysanura* to suggest another name for Nicolet's genus.—R. McLACHLAN, Lewisham: June, 1881.

Obituary.

Baron Maximilien de Chaudoir, the eminent Coleopterist, so widely known for his numerous works on the *Geodephaga*, to the study of which he exclusively devoted himself, died on the 6th May last, at the age of 64. His family estates were at

Jitomir, near Kieff, in the Russian province of Volhynia, and, from an allusion which he makes in one of his early papers to a three years' residence in his youth at Dorpat, we conclude that his education was completed at the University of that place. His first paper, published in the *Annales de la Société Entomologique de France* in 1835, was written in Dorpat, where he appears to have received some stimulus in his special studies from the inspection of the collection of Eschscholtz, who had recently died. To the first paper just mentioned quickly followed others, published in the "*Bulletin de la Société Impériale des Naturalistes de Moscou.*" The first contribution to the *Moscou Bulletin* which we are able to trace, appeared in 1837, and from that date there is scarcely a volume for upwards of forty years, which does not contain a paper from his pen. He was also a frequent contributor to the "*Zeitschrift*" of the Entomological Society of Berlin, in which he sometimes wrote in German; to the "*Annales*" of the Belgian Entomological Society, as well as the French; to the "*Annali del Museo Civico de Genova*;" the "*Revue et Magazin de Zoologie*;" and other publications. In 1844 or 1845, he undertook an Entomological excursion to the Caucasus, taking the Crimea on his way; the result of which he gave to the world in one of his very few independent works, entitled "*Enumération des Carabiques et Hydrocanthares du Caucase*," printed and published at Kieff in 1846. The *Hydrocanthares* (*Dytiscidæ*) of the work were catalogued and described by Hochhuth, M. de Chaudoir having never, in his long career, permitted his attention to be diverted from the group of *Coleoptera* to which he became attached in the days of his boyhood. A second independent work was his "*Catalogue de la Collection de Cicindélètes de M. le Baron de Chaudoir*," published at Brussels in 1865. We are not acquainted with any other, but the *separata* of many of his more important monographs, published in the Transactions of Societies, were issued as separate volumes, and placed in the hands of booksellers for the benefit of the Entomological public. Such were the "*Monographie des Callidides*" (204 pp.); the "*Mémoires sur les Thyroéptérides et les Coptodérides*" (256 pp.); the "*Monographie des Chlénien*" (315 pp.); and others. During the later years of his life, he spent much of his time in Western Europe, and finally took up his residence with his family at Amélie les Bains, in the Pyrenees, where he died. He several times visited England, and, on one occasion, spent many weeks in London, studying the *Collyridæ* of the British Museum collection, in preparation for the elaborate Monographic Revision of that Family, which he published in Paris in 1864.

He was also a frequent visitor to the French Capital, where the chief part of his magnificent collection of *Geodephaga* was kept for many years, in the house of his life-long friend, M. Auguste Sallé, No. 13, Rue Guy-de-la-Brosse. The collection had a narrow escape in the winter of 1870—71, a shell from a Prussian battery having exploded in the back yard after traversing the building obliquely from the roof to the first floor. For the number of its type specimens, and probably of its species, this collection was by far the most important of this group which had ever been brought together. It contained the great collection of the Count Dejean, augmented by the Marquis de la Ferté during the thirty years it remained in the hands of the latter, with the types of the "*Spécies Générale*" of Dejean, the "*Patellimanes*" of Laferté, and the numerous papers of Gory and Reiche, besides the acquisitions of its possessor through purchase and correspondence during forty

years of unflagging devotion to the pursuit. Before he died, he disposed of these accumulated treasures, ceding the *Cicindelidæ* to the Museum of the Jardin des Plantes, and the *Carabidæ* to M. René Oberthur.

M. de Chaudoir never pretended to be more than a systematist and describer, and it would perhaps be unjust to complain that his voluminous works contain no trace of broader views of biological science. His truly wonderful powers of minute analysis of forms were directed simply to the more accurate discrimination of genera and species for—the naming of collections. As a natural consequence, his genera and groups were always more or less artificial, though well adapted for their purpose; and his descriptions, when he thought necessary to describe fully, were models of clearness and precision. His relations with other Entomologists were always courteous and friendly, and he never indulged in controversial writing, however great the provocation.

John Blackwall, F.L.S., who died on the 11th May last, was born in 1789 (according to Hagen, 1790). His earliest scientific communications gave no indications of the subject which was to be his life's study.

Sixty years ago when residing at Crumpsall, near Manchester, he published, in Thomson's *Annals of Philosophy*, some Meteorological Observations in reference to the diurnal mean temperature, and the following year some notes on Migratory Birds, near Manchester, appeared in the *Memoirs of the Manchester Philosophical Society*, this was followed by *Observations on the Notes of Birds*, indeed, 15 of his first 25 papers related to Ornithology.

His earliest paper on Spiders appeared in 1827, in the *Transactions of the Linnean Society*, of which he was elected a Fellow in April, 1827; it is entitled "Observations and experiments made with a view to ascertain the means by which the Spiders that produce Gossamer effect their aerial excursions," and, in 1830, he published a notice in the *Zoological Journal*, "On the manner in which the Geometric Spiders construct their Nets." Indeed, of his second 25 papers, 18 are devoted to Spiders, only 3 to Ornithology, 2 to Ichthyology, and 2 to Entomological Subjects. Most of his papers were published in a collective form in 1834, under the title of "Researches in Zoology," a second edition of which appeared in 1873, and was noticed in this Magazine, vol. x, p. 142.

We believe it was in 1842 that he settled at Llanrwst, where he lived the remainder of his days.

John Blackwall's great work was "A History of the Spiders of Great Britain and Ireland," issued by the Ray Society in two parts in 1861 and 1864, this extends to 384 pp. large quarto, and is illustrated by 29 coloured plates. Mr. Blackwall himself contributed most liberally to the expense of the coloured plates.

The last thirty of Mr. Blackwall's separate papers were entirely devoted to Spiders. One feature in Mr. Blackwall's communications for the press is deserving of special comment, he wrote a hand which was truly "as clear as copper-plate," and that which he wrote was destined to appear in print, and his proof-sheets were returned to the printers with scarcely a single alteration, the charge for "corrections" in his case was certainly reduced to a minimum. It is a great pity that such a good example is not more generally followed.

SOME NEW SPECIES AND GENERA OF *COLEOPTERA* FROM NEW ZEALAND.

BY D. SHARP, M.B.

Mr. Richard Helms, of Greymouth, New Zealand, has sent to me recently a small parcel of *Coleoptera*, containing a few interesting novelties. Of these I have selected three or four as specially suited to be made known by means of isolated descriptions, and I have added to these descriptions two others introducing fresh genera to the New Zealand fauna. These forms are:—1. *Anchomenus Helmsi*, *n. sp.* (*Carabidæ*); 2. *Necrophilus prolongatus*, *n. sp.* (*Silphidæ*); 3. *Zeatyryrus* (*nov. gen.*) *Lawsoni*, *n. sp.* (*Pselaphidæ*); 4. *Lissotes Helmsi*, *n. sp.* (*Lucanidæ*); 5. *Chrosis violacea*, *n. sp.*, and 6. *Protelater nigricans*, *n. sp.* (*Elateridæ*); 7. *Scaphodius compactus*, *n. sp.* (*Chrysomelidæ*).

Necrophilus, *Zeatyryrus*, and *Scaphodius* have not before been recorded from New Zealand; the occurrence of the first of these genera there is very remarkable, as the species composing it have hitherto been found only in the northern parts of the Northern Hemisphere (Europe, Siberia, North America). On carefully comparing the New Zealand species with two of the Old World species, I have been unable to detect any character of generic distinction, although the New Zealand species is abundantly distinct in specific characters; this induced me to suppose that the New Zealand species might be one introduced there by some accidental means, but on further examination this has appeared in the highest degree improbable.

Mr. Helms's location on the West Coast of New Zealand, renders his collections of much interest, nearly everything hitherto described in the way of New Zealand beetles being from the countries to the east of the New Zealand Alps. A considerable portion of Mr. Helms's captures have been found to be new species and genera, and a paper has already been published on them by Herr Reitter,* of Vienna. Mr. Helms is placed in a very interesting country, and one that, judging from his discoveries, is favourable for beetles, and he seems also to be a very skilful collector, not merely one who picks up such things as insist on being caught by running about the roads or paths where the collector may happen to be walking. Judging from Herr Reitter's list, Mr. Helms's discoveries in *Colydiidæ* and *Pselaphidæ* are especially numerous, and all beetle-collectors know these are just the families whose successful collecting requires the most skill and per-

* Beiträge zur Käfer-fauna von New Zealand. Verh. Nat. Ver. Brünn. XVIII.

severance. There are good reasons to believe that the natural fauna of the Antipodes, more especially of New Zealand, is rapidly, like its native population, going to extinction, and yet, on a knowledge of its nature, there are dependent a large number of most difficult and important scientific questions. In these countries, men, therefore, who will at present collect well, and take proper steps for the preservation of what they collect, are really very valuable, and deserve the encouragement of their fellows.

ANCHOMENUS HELMSI, *n. sp.*

Sat elongatus, parum nitidus, nigro-piceus, antennis, palpis pedibusque rufo-testaceis; prothorace parvo, lateribus postice fortiter sinuatis, angulis posterioribus rectis, basi utrinque profunde impresso; elytris sat convexis, lateribus valde curvatis, profunde striatis, prope apicem fortiter sinuatis.

Long. 11, lat. 4 mm.

Similar in appearance, and more particularly in colour, to *A. otagoensis*, Bates, but abundantly distinct, rather smaller, the upper surface less opaque and not so flat, the thorax shining, the elytra deeply striate. The thorax is much rounded at the sides, and much constricted behind, the posterior part of the sides is quite straight, and the hind angles are abruptly marked, and quite rectangular; the surface is not flat, but is deeply impressed on each side at the base; the mesial longitudinal channel is very distinct. Elytra rather short, the sides and shoulders much curved; the striæ deep, but not punctate: the interstices are broad and but little convex, the three punctures on the third moderately distinct. There is but little difference between the male and female, even the front tarsi of the former being but little dilated.

Greymouth, No. 6, Helms.

NECROPHILUS PROLONGATUS, *n. sp.*

Niger, nitidus, lævigatus, antennarum basi rufescente, prothoracis lateribus late testaceis; elytris ad apicem attenuatis, ultra abdominis apicem prolongatis, subtiliter striatis, striis in partem prolongatam profundioribus et fortiter punctatis.

Long. 10, lat. 4 $\frac{3}{4}$ mm.

Antennæ with the basal five joints piceo-rufous, slender, and shining, the apical five abruptly broader than the others, fuscous-black, densely pubescent and opaque; head closely and finely punctured, even in front; the clypeal suture indistinct, angulate in the middle. Thorax rather strongly transverse, the front angles extremely rounded off and indistinct, and not projecting farther forwards than the middle of the front margin; the disc sparingly and obsoletely punctured, the explanate yellow sides more distinctly punctured. Elytra rather narrow and elongate, with their apices prolonged, and the prolonged portion abruptly bent down; they are rather finely striate, but the interstices are somewhat convex, and the 7th is elevated at the shoulder; the striæ are provided with fine, distant impressions or punctures;

on the apical, and more especially on the lateral-apical, portion the sculpture becomes deeper and coarser, so that the outer stria bears some very large, deep, impressions. On the under-surface it is seen that this apical portion of the wing-cases projects quite beyond the hind-body. The two individuals described are females.

The species appears structurally very similar to the European and North American species of *Necrophilus*, and the peculiar form and sculpture of the wing-cases would not at present justify its being treated as a distinct genus.

Greymouth, No. 57, Helms.

ZEATYRUS (*n. g.*) *LAWSONI*, *n. sp.*

Convexus, rufescens, nitidus, parcius pubescens, fere impunctatus; prothorace sub-globoso; elytris brevibus, pallide rufis. Long. $1\frac{2}{3}$ mm.

Antennæ rather stout, first joint longer than broad, slightly longer than the following ones, 2nd and 3rd sub-equal in length, the latter more slender than the former, 4—8 differing but little from one another, the first of them rather longer than broad, the last rather broader than long, 9th joint much broader than the 8th, transverse, 10th strongly transverse, 11th large, rather broader than the 10th, and three times as long as it. Head shining, impunctate, with a fovea behind each of the large frontal tubercles. Thorax sub-globose, almost impunctate, destitute of foveæ. Elytra short, but little longer than the thorax, much narrowed towards the shoulders, convex or inflated, of a paler red than the rest of the surface, sparingly and very obsoletely punctured, without sutural stria. Hind-body greatly deflexed, strongly margined at the sides; legs elongate.

A single specimen of this species was found by Mr. Lawson at Auckland some years ago.

This insect must form a new genus in the family *Pselaphidæ*, the characters of which I give below.

Antennæ stout, inserted in two cavities on the front of the head, near, but distinctly separated from, one another; front with two approximate but distinctly separated tubercles over the antennal insertion. Maxillary palpi rather elongate, the 2nd joint somewhat elongate, curved or emarginate in front, angularly dilated behind, and furnished with an elongate seta on the prominent angle; 3rd joint quite small, about as long as broad, 4th joint excessively dilated, so as to form a large knob, with a minute tubercle or angle on its front edge internally. Metasternum very short; middle trochanters elongate; claws of the tarsi two, quite distinct.

The genus should be placed next to *Tyrus*, from which its remarkable maxillary palpi readily distinguish it. Its nearest allies are the Australian *Tyrus mirandus*, and the New Zealand *T. mutandus*.

LISSOTES HELMSI, *n. sp.*

Niger, opacus, prothoracis elytrorumque marginibus squamosis; capite prothoraceque crebre punctatis, hoc lateribus rotundatis, margine anteriore leviter bisinuato, angulis posterioribus omnino latissime rotundatis; elytris sat crebre punctatis, seriebus quatuor squamorum brevium erectorum.

Long. corp. (sine mandibulis), 20 mm., lat. 10 mm., ♂.

Head with numerous punctures on the upper surface, which, on the extreme vertex, become almost dense: the hind angles slightly prominent but without any distinct projection. Prothorax very strongly transverse, with very numerous, rather fine, punctures; its front has a slight but distinct margin, which becomes obsolete in the middle, the sides are a little curved, and the hind angles are very broadly rounded; side margins very densely covered with very short fulvous setæ, or scales. Elytra short and broad, dull, with four longitudinal series of closely-packed, erect, very short fulvous setæ, and with the strongly raised side-margins very densely covered with similar setæ, the surface between the series very distinctly punctured. The upper-inner face of the hind tibiæ is distinctly longitudinally sulcate; the apical spurs are broad.

The male has the mandibles short and stout, strongly curved, with a short basal tooth, which overlaps the labrum, and a very large tooth in the middle, which, when the mandibles are closed, meets that of the opposite mandible, just in front of, but below, the labrum. The female is unknown.

Found at Greymouth, West Coast of New Zealand, by Mr. Helms; in recognition of whose successful researches I have named the species.

This species is allied to *Lissotes capito*, Deyr. and Parry, from the Chatham Islands, but is abundantly distinct, by the form of the thorax, the series of setæ on the elytra, the punctured head and prothorax, distinctly sulcate hind tibiæ, and other less important characters; there is not, I believe, any species at all similar to it known as occurring in New Zealand.

CHROSIS VIOLACEA, *n. sp.*

Elongata, versus apicem attenuata, sat nitida, nigra, supra violacea; prothoracis lateribus pone angulos anteriores angulariter prominulis.

Long. 12—15, lat. 3 $\frac{3}{4}$ mm.

Antennæ deep black, just as long as head and thorax. Thorax elongate, of peculiar form, the sides commencing at the front angles as if they were going to be a good deal rounded and directed outwards, but very shortly becoming all at once a little narrower, and parallel with one another, so that a small conspicuous prominence is formed on each side near the front, the hind angles gradually but strongly directed outwards; the sides are densely and rather coarsely punctured, the middle smooth and nearly shining, the surface bears a very short and fine upright black pubescence. Elytra strongly narrowed towards the extremity, distinctly striate, the striæ rather strongly punctate, the interstices moderately closely and finely punctate; each wing-

case terminates as an acute point, placed at some distance from the suture: under-surface with a fine cinereous pubescence, the last abdominal segment terminating on each side as an acute tooth. The legs are slender, the tarsi particularly slender.

This distinct species will be very readily identified. I think it likely that it may prove to be sufficiently distinct structurally, from the other species of *Chrosis* to form a new genus.

Greymouth, No. 22, Helms.

PROTELATER NIGRICANS, *n. sp.*

Elongatus, angustulus, sub-cylindricus, niger, sparsim tenuiter pubescens, sat nitidus, prothoracis angulis posterioribus picescentibus, abdomine nigropiceo, lateribus rufis.

Long. 11, lat. $2\frac{3}{4}$ — $2\frac{7}{8}$ mm.

This species is the largest *Protelater* yet discovered, and may thus be easily identified also by its black colour, comparatively shining surface, and scanty pubescence. The thorax is shining, rather sparingly and distinctly punctured, the elongate hind angles are much directed outwards; the elytra are rather deeply striate, the striæ distinctly punctured; the interstices are more finely and sparingly punctured, the 3rd, 5th, and 7th are, beyond the middle, more elevated than the others.

The colour of this species is very probably variable; compared with the large variety of *P. elongatus*, I find that *P. nigricans*, independent of the colour and sculpture, is distinguished by more elongate antennæ, and by the hind angles being more abruptly directed outwards.

Greymouth, No. 59, Helms.

SCAPHODIUS COMPACTUS, *n. sp.*

Minutus, breviter ovalis, convexus, nitidus, niger, antennarum basi orisque partibus testaceis, pedibus anterioribus fusco-testaceis, posterioribus piceis: prothorace subtiliter sparsim punctato; elytris striatis, striis punctatis.

Long. $1\frac{1}{2}$ mm.

Labrum, palpi, and basal joints of the antennæ pale yellow, the terminal four joints of the latter deeply infusate. Prothorax at the base continuous with the elytra, to which it is very closely applied, the sides much narrowed in front, very distinctly margined, its surface very shining, and bearing minute, scanty, somewhat elongate punctures; elytra very distinctly striate, the striæ fine at the base, distinctly punctured, the sutural angles rounded.

Of this peculiar little insect I have seen only one individual in bad condition, which I obtained from the collection of the late Andrew Murray. I believe it may be referred to the genus *Scaphodius*, recently established by Chapuis for the New Caledonian *Cryptocephalus straticollis*; as, however, that insect is scarcely known to entomologists, and I have not seen it myself, there is considerable doubt whether these two insects will prove to be really congeneric; I think it, therefore, well to subjoin the characters I have been able to detect in the specimens before me.

Head small, received into, and exactly adapted to, the front of the prothorax. Antennæ short, and rather slender, joints 3—6 small, and so closely applied to one another as to be scarcely distinguishable; joints 7—11 a good deal broader than the preceding ones. Middle of pronotum prolonged behind, and its apex with a small deep notch, adapted to the narrow, small scutellum. The coxæ all very widely separated, the anterior ones very near the front edge of the prosternum. The prosternum is flat along the middle, and the mesosternum is elevated in the middle so as to form a short, very broad process, connected with the prosternum by a quite straight transverse suture, the two parts being so closely applied together as to appear one; this raised portion of the mesosternum is quite continuous in plane with the metasternum, and thus the body along the middle line is very consolidated: the 1st ventral segment is large, the 2nd very short, the sutures between 1st and 2nd, and 2nd and 3rd segments quite straight, the two following sutures strongly arcuate, so that the 3rd segment appears quite divided in the middle, 5th segment large, with a broad shallow impression extending along the middle. Pygidium exposed.

Thornhill, Dumfries:

May, 1881.

NOTES ON THE BRITISH *BYTHOSCOPIDÆ*.

BY JAMES EDWARDS.

The fact that certain species in this group, and more particularly in the genus *Pediopsis*, are not so well defined as could be desired, induces me to offer to the readers of this Magazine the result of my own observations in the form of a synoptical table of all the species at present recorded as British, and notes on some of the more obscure species. My object in so doing is to call attention to these insects, with the view to their being more extensively collected, as it is impossible to form any adequate idea of the limits of a species except by studying a series of examples.

The *Bythoscopidæ* may be easily distinguished from all other British *Homoptera* by the antennæ being inserted between the eyes and the ocelli situate on the frons.

TABLE OF GENERA.

- | | | |
|-----|--|---------------|
| (6) | 1. Anterior margin of crown broadly rounded. | |
| (5) | 2. Sculpture of pronotum distinct. | |
| (4) | 3. Species dirty white, with black or fuscous markings..... | AGALLIA. |
| (3) | 4. Species green, reddish-testaceous, or bluish-green | MACROPSIS. |
| (2) | 5. Pronotum not perceptibly sculptured | IDIOCERUS. |
| (1) | 6. Anterior margin of crown obtusely angular. | |
| (8) | 7. Sculpture of thorax transverse..... | BYTHOSCOPIUS. |
| (7) | 8. Sculpture of thorax running obliquely from the central line
of thorax to its margin..... | PEDIOPSIS. |

AGALLIA.

- (4) 1. Pronotum twice, or nearly twice, as long as the crown. Insects macropterous.
- (3) 2. Pronotum faintly punctured *puncticeps*.
- (2) 3. Pronotum transversely striate *venosa*.
- (1) 4. Pronotum only slightly longer than the crown. Insect brachypterous *brachyptera*.

MACROPSIS.

- (2) 1. Elytra pale bluish-green, very finely punctured with black. Length, about $1\frac{3}{4}$ lines *microcephala*.
- (1) 2. Elytra bright green (♀) or reddish-testaceous (♂). Length, about $3\frac{1}{2}$ lines *lanio*.

IDIOCERUS.

- (4) 1. 1st and 2nd apical areas of elytra sub-equal in length, *i. e.*, their bases level, or nearly so.
- (3) 2. Cheeks densely white pubescent *adustus*.
- (2) 3. Cheeks bare *lituratus*.
- (1) 4. 1st apical area much longer than 2nd.
- (6) 5. 1st sub-apical area triangular or 5-sided, reaching the costa *varius*.
- (5) 6. 1st sub-apical area parallel-sided, not reaching the costa.
- (8) 7. Nerves of elytra chequered with black and white *Heydeni*.
- (7) 8. Nerves of elytra not chequered.
9. Elytra with a white H on each *H-album*.
10. Elytra white, their base, and a broad transverse band in the middle, brown *tremula*.
11. Elytra with a white transverse band beyond the apex of the clavus *laminatus*.
- (15) 12. Elytra yellow or greenish-yellow, generally with a reddish-brown tinge.
- (14) 13. Side margins of face at most faintly sinuate. Antennal plate in ♂ oval, abrupt..... *populi*.
- (13) 14. Side margins of face obtuse angularly indented. Antennal plate in ♂ gradual and very narrow.... *fulgidus*.
- (12) 15. Elytra white..... *confusus*.

BYTHOSCOPIUS.

- (4) 1. Face (seen in profile) somewhat flattened.
- (3) 2. Wings fumose in ♂, hyaline with a fumose border in ♀. Genital plate in ♀ semicircularly emarginate..... *alni*.
- (2) 3. Wings hyaline, with a fumose border in both sexes. Genital plate in ♀ triangularly emarginate *rufusculus*.
- (1) 4. Face strongly rounded. Wings as in *alni* *flavicollis*.

PEDIOPSIS.

1. Elytra whitish, nerves of corium pale, of membrane dark..... *nanus*.
2. Elytra whitish, nerves of corium and membrane green ... *virescens*.
3. Posterior tibiae with two short black streaks on the inner side, one near the apex, the other near the base *tibialis*.
4. Posterior tibiae not as above.
- (14) 5. Face distinctly spotted with black.

- (9) 6. Nerves not darker than elytra.
- (8) 7. Face with five black spots *impurus*.
- (7) 8. Face with four black spots..... *distinctus*.
- (6) 9. Nerves darker than the elytra.
- (11) 10. Nerves but little darker than the elytra. Face with very indistinct traces of the short, double, longitudinal, dark line between the two uppermost spots... .. *fuscinervis*.
- (10) 11. Nerves black or nearly so.
- (13) 12. Nerves of the corium only black. Face without any trace of dark markings between the two uppermost spots *nassatus*.
- (12) 13. Nerves of corium and membrane black, or nearly so. Face with a distinct double, longitudinal dark line between the two uppermost spots *scutellatus*.
- (5) 14. Face not distinctly spotted with black.
15. Elytra brownish-testaceous, sprinkled with fuscous atoms.
Head and thorax greenish-yellow..... *tiliæ*.
16. Elytra testaceous, with an abbreviated, transverse, dark brown band in the middle *cereus*.
17. Elytra testaceous, nerves darker, along the costa a narrow dark line *ulmi*.

The above tables (which, with one or two exceptions, were drawn with the insects before me) may perhaps be useful in naming any of the species hitherto recorded as occurring in this country; but they are only intended as a key to the detailed descriptions which have, from time to time, appeared in this Magazine, and, like all contrivances of their kind, they must be applied strictly and with great care.

Agallia puncticeps and *venosa* are common, but *brachyptera* is, I believe, only recorded from Scarborough. *Macropsis microcephala* is said to be attached to *Helianthemum*, and is therefore local, but *M. lanio* is common everywhere on oaks.

The determination of the species of *Idiocerus* presents no difficulty, except, perhaps, in the case of *populi* and *fulgidus*. The latter, however, may be separated by the structural characters given above. The difference between the very narrow and gradual antennal plate of ♂ *fulgidus* and the oval abrupt one of *populi*, although not noticed in Kirschbaum's description, is very striking. *I. venustus* I omit on the authority of Mr. Scott, who says that it "may be considered as a variety of *I. varius*." The number of our species, however, remains the same, as I am able to introduce with certainty the genuine *I. varius*, Fab. My experience of the habitats of these beautiful insects is as follows: *adustus* and *lituratus* common, on willow trees; *varius* scarce, on osiers; *Heydeni* and *H.-album* on Lombardy poplars; *confusus* on white poplar; *fulgidus* on black poplar; and *populi* on poplars generally.

The species of *Bythoscopus* are common and easily recognised, notwithstanding their extreme variability. *B. alni* occurs on alders, and *rufusculus* on sallow, while *flavicollis* exhibits a marked preference for birch.

The characters of *Pediopsis fuscinervis* and *nassatus* given above are taken from Mr. Douglas' type examples, which he was so good as to lend me; but I fear that they are the characters of individuals rather than of species. The *scutellatus* of my collection agrees with Mr. Douglas' examples of that species, but not so my *nassatus*, which latter is larger and paler than *scutellatus*, with the nerves of the elytra fine, rust-brown, and the two comma-shaped polished spaces on the lower part of the frons are nearly obsolete, the latter structure in *scutellatus* being much larger, well defined, and filled up with black. Whether or not my insect is the *nassatus* of Continental authors, it is impossible to say, without comparing it with authentic specimens, as the evidence to be gathered from the published descriptions is scarcely satisfactory. It is to be observed that Sahlberg says of *nassatus*—"tegminibus obsolete venosis," and he puts *fuscinervis*, Boh., doubtfully, as a variety thereof, chiefly distinguished by having the transverse nerves of the elytra strongly infuscated. Unfortunately, in the *Bythoscopidæ* the genitalia, which in other groups furnish valuable distinctive characters, afford little or no assistance, the differences observable being of the most trifling description.

Notwithstanding the confusion prevailing amongst these species at the present time, there is every reason to believe that the examination of a larger series of examples from various parts of the kingdom, would enable one to define the species we already possess with something like certainty, and it should be remembered, that the chances of meeting with new species are very considerable.

One word as to the collection and preservation of the *Bythoscopidæ*. These insects are in greatest abundance from the middle of August to the middle of November, and the most productive trees are sallows, willows, and poplars; the sweeping net, too, may be used with advantage. M. Lethierry finds certain species on firs in February and March, but I have not been so fortunate. Single examples are certainly best pinned with a fine pin through the *scutellum*, as this admits of an examination of the under-side without further trouble; but if examples are plentiful, they may be gummed on card, either simply or with the elytra and wings spread out, and a few specimens may be subsequently reversed, if necessary.

A NORTH AMERICAN SPECIES OF *DILAR*.

BY R. McLACHLAN, F.R.S., &c.

At p. 39 of Vol. xvii of this Magazine (July, 1880) I described a species of the singular genus *Dilar* from South America. It is now necessary to record the genus as *North American*, Dr. Hagen having just forwarded to me one ♀ example (not in very good condition) taken by Mr. Sanborn at Bee Spring, Kentucky, in June, 1874. The following description is the best I am able to draw up, in the absence of further materials of both sexes, and in better condition.

DILAR AMERICANUS, *n. sp.*

Body whitish, with a faint yellowish tinge, clothed with whitish hairs, with which a few blackish are intermingled. Face yellowish. Eyes metallic-silvery. On the head above are three very large, somewhat closely placed, rounded-oval tubercles. Antennæ concolorous with the body, apparently 17-jointed, the joints short, somewhat moniliform, not toothed internally at the apex, the terminal joint ovate. Legs whitish, with white hairs; the tips of the femora, tibiæ, and tarsi testaceous; claws minute, simple, piceous. Apex of the abdomen forming an elongate pyriform opening, in the middle of which are two large rounded, whitish, finely granulose tubercles (extraneous bodies?): ovipositor longer than the entire body in the dry insect, yellowish-white, semi-transparent, slender, slightly curved. Wings pale whitish-hyaline, each with about twenty rather large greyish spots, some of which, in the apical half of the wing, show a tendency to unite into fasciæ: neuration pale, darker in the spots, hairs long, whitish, but mixed with blackish, especially on the spots; sub-costal area almost without transverse nervules; costal veinlets simple, with faint indications of marginal rudiments between them; principal sector with five branches in both pairs; transverse nervules very few, so that the neuration is remarkably open; a discal horny point between the 1st and 2nd branches of the sector; nearly all the apical and marginal nervures bi- or tri-furcate, with minute marginal rudiments.

♀. Length of body (without ovipositor), about 3 mm.; length of ovipositor, about $3\frac{1}{2}$ mm. Expanse of wings, about 14 mm.

Viewed in the light of increased information, it is possible that both this and the S. American *D. Prestoni* may eventually be separated generically from the Old World forms; but the materials are yet too few. They are very small in size and pale in colour; the structure of the antennæ in both sexes probably differs slightly: the neuration is much more open, with only few transverse nervules, and there appears to be only one (many-branched) sector of the radius, whereas in the European and Eastern forms there is a simple (forked at the end) sector emitted from the radius before the branched one that runs parallel to it.

LIFE HISTORY OF *GELECHIA BRIZELLA*.

BY HENRY MONCREAFF.

When full-fed the larvæ are four lines long, tapering towards each end. Head, and plate on second segment, shining brown; body pale orange-coloured, a large circular blotch of lighter colour covering the dorsal part of the eighth and ninth segments; skin in loose folds along the spiracles, which are pale brown; legs and claspers annulated with dark brown; several stiff hairs on each segment. Pupa light brown, the circular blotch spoken of above showing plainly through the case.

So far back as the year 1873 I became acquainted with this larva. Whilst examining sweepings from off *Statice limonium*, I was somewhat surprised to see many of the flowers apparently erect themselves and walk across the paper. On examination, I found that each was tenanted by a small larva, the head and first pair of legs of which protruded through the small end of its ready-made case, and this led me at first to think that I had discovered a new *Coleophora*.

I secured a number of the larvæ, together with a bunch of the *Statice*. The larvæ fed on the flowers and unripe seeds, and were full fed by the end of October, when they spun together several of the flowers, and formed among them a tough silken cocoon, remaining in this unchanged till May, when they entered the pupa state, the imagines emerging through June and July.

This must be a semi-aquatic species, as at every spring tide the marshes where it occurs, and the plants on which it feeds, are under water. During the winter months the marshes are swept by the high tides, and the dried flower-heads of the *Statice*, with other marsh refuse, form large heaps at the high-water mark, among which the larvæ remain in their water-tight cocoons warm and secure until the time of emergence.

I am sorry to say that the marsh on which this and other species occurred so abundantly has been, for some time, in process of reclamation, and now lies under some feet of harbour-mud, but I hope to find it in another locality.

Stainton, in the Manual, says, "Larvæ in flower-stems of *Statice armeria*." This plant abounds with us, but I have never found the slightest trace of the larva either in the flowers or stems of that plant. Has any one else?

High Street, Portsmouth:

June 8th, 1881.

DESCRIPTION OF THE LARVA OF *ENNYCHIA OCTOMACULALIS*.

BY WILLIAM BUCKLER.

The larva of this species is, barring Ichneumons, easy enough to bring to full growth and to spinning its cocoon for hibernation, but most difficult to prevent from dying afterwards at the critical time when the larva should become a pupa: this at least has been the experience of my friend Mr. Wm. R. Jeffrey, and myself for four years in succession.

Mr. Jeffrey found five or six of the larvæ first on September 19th, 1877, and kindly sent some of his captures to me; at that time the species was of course unknown to us, and our hopes that one or other might rear a moth were entirely foiled by all the larvæ dying within their cocoons before pupation.

In 1878, Mr. Jeffrey found but two larvæ, and these again both died in the same way: in 1879 he found four, and shared them with me; before hibernation we each lost one larva by parasites, and again the unstung examples died in their cocoons.

Nothing daunted by all this failure, Mr. Jeffrey persevered in his search again last year, and on the 18th of August found four of our still *unknown* larvæ, and again, on the 3rd of September, three more in a younger stage than any previously detected; my friend kept for himself but two larvæ, part of the four first found; yet, most fortunately, with one of these he has been successful in solving our puzzle, and on the 2nd of the present month he had the pleasure of breeding a fine female *E. octomaculalis*, and great indeed is the satisfaction this success has given to both of us.

Hitherto as a larva unknown in England, this species is mentioned by Dr. E. Hofmann, in his "Kleinschmetterlingsraupen," as living on and skeletonizing the under-side of the leaf of *Bellidiastrum Micheli*; but he gives no description of the larva itself, nor does he say whether Hartmann, whom he quotes, has described it.

In this country the larva is found in a slight whitish web on the under-side of the lowermost leaves of *Solidago virgaurea*, eating away large portions from them; when only the length of a quarter of an inch it is of a whitish-green tint with greener dorsal line, but after the next moult assumes very much the appearance in all but size of the adult, and again moults before attaining its full dimensions.

When full grown the larva is from five-eighths to nearly three quarters of an inch in length, tapering at both ends, the head somewhat broader near the mouth than at the crown, the segments of the

body well cut at the divisions, particularly on the belly where they are very plump, on the back there is a deep sub-dividing wrinkle across the middle of each segment, and an ordinary wrinkle on each sub-division, the ventral legs slender, the anal pair stretched out behind in a line with the body, and the head similarly extended in front.

In colour the head is whity-brown, having a few light brown freckles and black ocelli, the back is broadly of a delicate light opaque cream-colour divided by a narrow dorsal stripe of rich and very deep translucent green, narrowest at each end, and sometimes there shows faintly within a still darker pulsating vessel; the pale cream-colour extends lower down the side of the hinder half than on the front half of each segment, and near the lower margin of this colour is a fine line of translucent yellowish-green, a little interrupted towards the end of some of the middle segments; the space between the light cream-colour and the faintly-showing tracheal thread is of translucent green, broadest on the front half of a segment, below on the anterior segments is a stripe of lighter semi-transparent green, which melts away into the still lighter watery opalescent or greenish tint of the belly and legs; the tubercular slight warty prominences have each a small central dot of transparent green, bearing a fine whity-brown hair; the third and fourth segments have sometimes a minute black lateral dot; the spiracles appear as most minute brownish-black rings; the whole surface of the skin is glossy.

When full-fed the larva turns almost of an uniform yellow, though the back still retains its opacity beneath the glossy skin, and soon it spins for itself, either between the leaves or in an angle of some convenient surface, a whitish semi-opaque silken outer cocoon of strong texture, from three quarters to an inch in length, and within it an inner series of open-wrought threads, forming a kind of loose hammock, in which it passes the winter unchanged.

The cocoon which Mr. Jeffrey sent me to examine is three quarters of an inch long and of oval form, ruptured to the extent of not quite an eighth of an inch by the exit of the moth at the top of one end, close to the lene to which it was spun above, and spun below to a leaf; the silk was whitish inside but externally had become of a dirty flesh-tint. The pupa-skin of ordinary figure lying back uppermost, had the tail held fast by threads of the hammock which supported it free from contact with the outer cocoon, the tail being very near the end opposite to that from which the moth emerged; the skin itself was exactly three-eighths of an inch long, moderately stout, with

well developed thorax and long wing covers, the tail of the abdomen tapering to rather a prolonged blunt point; in colour of a darkish warm brown, darkest on the thorax and anal point, the surface of the wing-covers and lower rings of the abdomen shining.

Emsworth: *July 12th*, 1881.

NOTES ON THE SPECIES OF *OPHTHALMOPHORA*, A GENUS OF GEOMETRID MOTHS.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The genus *Ophthalmophora* was founded by M. Guenée in the first volume of his "*Uranides et Phalénites*," for the reception of six beautiful species of moths, having upon the upper surface of their wings metallic, golden and silver lines and ocelli: the first three of the species described are supposed, though with doubt, to be from Brazil; none of them appear to be in the British Museum, though allied to *O. elysiata*.

The fourth species recorded by M. Guenée is *O. corinnaria*, a very pretty little species allied to *O. formosanta* of Cramer, and, if I am correct in my identification of the latter species, more nearly allied than M. Guenée supposed: unfortunately, we possess no examples of the genus from Surinam, but, judging from an example of what I take to be *O. formosanta*, obtained by Dr. Trail on the Rio Negro, I should say that the chief differences in M. Guenée's species were the less defined (sometimes even obliterated) pale costal border to the primaries, and the distinctly ocelloid character of the oval marginal spot of the secondaries.

If we set aside the close affinity of *O. corinnaria* to *O. formosanta*, which must, for the present, be open to question, the next point for consideration is, whether it is possible to separate specifically the form described and figured by Herr Snellen under the name of *O. lyonetaria*.

Herr Snellen says that *O. lyonetaria* "is distinguished from all the recognised species by the clear dark grey front wings with unicolorous front margin;" in two specimens of *O. corinnaria* which we have from Santarem, one has a whitish costal border as in Guenée's figure, the other has lost it as in Snellen's figure; yet, in every other respect, the two examples are almost identical; such being the case, I cannot think that the two so-called "species" are more than sports of one type.

Allied to the above is a beautiful little species, formerly in Mr. Norris' collection, from Limas—

Ophthalmophora bella, sp. n.

Primaries above rusty chocolate-brown, transversely streaked with greyish or sericeous whitish-brown; costal border silvery-white, the striæ upon the costal area being also white; extreme edge of costal margin slightly yellowish; an arched sub-basal silvery-white line; a broad extremely oblique belt, its inner two-thirds silvery-white, and its outer third pale creamy-buff, from the inner margin to the second median branch, where it joins a slightly curved transverse grey stripe, which runs to the sub-costal vein; fringe creamy-white; secondaries silver-grey, densely irrorated with chocolate-brown, excepting at the borders; base chocolate-brown, bounded by a broad pearly-white band; apical border, from costa to second sub-costal branch, white, fringe creamy-buff; a forked, shining, metallic, opaline, tin-like band from the costa, its outer fork sub-marginal and bounding the apical patch, its inner fork terminating abruptly at the radial vein; between these forks is a conspicuous black ocellus with buff iris and crescent-like mother-of-pearl centre; a sub-marginal, embossed, plumbageous spot, with pink reflections, on the lower radial interspace, and therefore just beyond the apical sub-marginal forked tin-like band; this spot is followed by four pure silvery sub-marginal spots; fringe of this part of the wing of the same pale grey as the border; abdominal border sparsely spangled with shining opaline scales; body grey, abdomen narrowly banded with white; antennæ cream-coloured, with yellow inner margin: under-surface pure white; primaries, with the discoidal and apical areas, grey, and the costa pale buff; legs pale buff.

Expanse of wings, 1 inch, 4 lines.

Limas.

This beautiful little species is one of the links between the *O. formosanta* group and *O. amabilis* of Cramer, with which two types M. Guenée concludes his enumeration of the species of this genus.

Of the two forms described subsequently by Mr. Walker, *O. elysiata* comes nearer to *O. formosanta*, whereas, *O. danaeata* forms the type of a third group, having a series of four well-defined ocelli across the secondaries.

Nearest to *O. elysiata*, but also apparently allied to *O. alectaria* of Guenée, is a handsome new species recently received from Rio Janeiro—

Ophthalmophora Lucilla, sp. n.

Primaries above dull ferruginous, discoidal area sparsely mottled with small white striæ; costal border grey, densely striated with white, the edge creamy-white; fringe chrome-yellow; an oblique abbreviated band from the centre of the inner margin to the first median branch; white internally, bright yellow and widely diffused externally, bounded within by a dull blackish angulated stripe, which runs upwards to the lower radial vein, its extremity being interrupted by a small tapering triangular yellow spot; two metallic plumbageous spots on the median interspaces; secondaries yellow, densely irrorated with dull ferruginous; base greyish-brown, limited by an

oblique sub-basal white stripe, continuous with the oblique band of the primaries; fringe yellow; outer border ochreous, with ferruginous marginal line; an embossed, macular, sub-marginal, metallic, tarnished silver stripe, which curves round at apex so as almost to enclose a large, pale, rust-red patch, in the centre of which is a highly embossed, golden, ocellid spot, with black edge and brown edged yellow iris; an irregular, almost W-shaped, series of scattered shining gold scales on the interno-median area; body grey, abdomen with narrow white margins to the segments and a white basal band; under-surface cream-colour, the outer half of the primaries and the external area of the secondaries washed with stramineous; a dusky marginal line; fringe yellow; primaries with bright ochreous costal border; interno-basal and discoidal areas slightly greyish; apical area and outer border broadly greyish-brown; secondaries with the sub-marginal stripe and ocellus of the upper-surface represented by grey spots.

Expanse of wings, 1 inch, 6 lines.

Rio Janeiro.

The *Phrygionis pallicosta* of Felder and Rogenhofer (a specimen of which we have from Limas) is, I think, nearer to *Byssodes* than to *Ophthalmophora*, and the *Phalæna hilaria* of Cramer, referred to the latter genus with doubt by Walker, does not seem to me to have anything in common with it.

The species of the genus will, therefore, now stand as follows:—

1. *Ophthalmophora danaeata*, Walker. Santarem. Brit. Mus.
2. " *elysiata*, " Ega. "
3. " *Lucilla*, Butler. Rio Janeiro. "
4. " *alectaria*, Guenée. Brazil?.
5. " *pamphilaria*, " "
6. " *lyllaria*, " "
7. " *formosanta*, Cramer, Surinam. Rio Negro. Brit. Mus.
8. " { *corinnaria*, Guenée. } Santarem. Brit. Mus.
 { *var. lyonetaria*, Snellen.* }
9. " *bella*, Butler. Limas. Brit. Mus.
10. " *amabilis*, Cramer. Surinam. Pará. Brit. Mus.
11. " ? *pallicosta*, Felder. French Guyana. Limas. Brit. Mus.

British Museum:

May, 1881.

Black form of Amphidasis betularia at Gainsborough.—It may interest your readers to know that I have taken three specimens of this black variety here. The third specimen I took this morning at rest on the walls of my house. I am not aware that this form of the insect had previously been recorded as occurring in this locality.—F. M. BURTON, Highfield, Gainsborough: June 27th, 1881.

* Described as from Jamaica.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 28.)

4. SPILOGASTER, Macq.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in male; arista plumose or sub-plumose; alulets well developed, the lower scale always longer than the upper one; abdomen mostly conical, and always spotted; anal vein not prolonged to the margin of the wing.

Sect. 1—*Legs entirely black.*

- | | |
|--|----------------------------|
| 1. NIGRINERVIS, Zett. | 4. QUATUOR-MACULATA, Fall. |
| 2. MACULOSA, Meig.
<i>sigillata</i> , Rond. | 5. DUPLICATA, Meig. |
| 3. NOTATA, Fall. | 6. DUPLARIS, Zett. |

Sect. 2—*Legs partly pale.*

- | | |
|---|--|
| 7. COMMUNIS, Desv.
<i>cæsia</i> , Macq. | 9. DEPUNCTA, Fall.
<i>modesta</i> ?, Meig. |
| 8. QUADRUM, Fab.
<i>anceps</i> ?, Zett.
<i>calceata</i> ?, Rond.
<i>supera</i> ?, Wlk. | 10. FLAGIPES, Rond.
11. ULIGINOSA, Fall.
12. CONSIMILIS, Fall.
13. FUSCATA, Fall. |

This genus contains several species which are very difficult to determine, they being so closely related, that it is almost impossible to separate them by distinct points of structure. This remark may be applied to the males, but it is still more applicable to the females; some of which, as R. Desvoidy pointed out in his remarks on his genus *Mydina*, are so different both in form and colour from those of the opposite sex, that it is very difficult to know to what species they belong, unless the two sexes are found together. On this account, it is not easy to draw up a correct list of species; I have, however, carefully examined all the specimens I have seen, and if I have erred, I believe it will be on the side of making too few rather than too many species.

S. MACULOSA, Meig.

S. NOTATA, Fall.

These two species bear a great resemblance to each other, and are often mixed together in collections; but they may be distinguished from each other by the following differences of character. The former is generally rather larger and more elongated in shape than the latter; the arista is shorter haired in *S. maculosa* than in *S. notata*, though it is not very long haired in either species; the scutellum has a black spot on either side in *S. maculosa*, but only one central black mark at the

base in *S. notata* ; the 4th and 5th longitudinal wing veins are parallel, or slightly divergent at their extremities, in *S. maculosa*, while the 5th vein converges a little towards the 4th at its extremity in *S. notata*. The former is the more common species.

S. 4-MACULATA, Fall.

This may be distinguished from all of the three following species, to each of which it bears considerable general resemblance, by the following points of structure ; it has the arista shorter haired ; it has only three dorsal thoracic bristles behind the transverse suture in the row between the middle and lateral black stripes instead of four ; and the posterior tibiæ are furnished with a number of long hairs on their inner sides, which are absent in the others. This species is not very common.

S. DUPLICATA, Meig.

Several different but very closely allied species have been confounded together under this name. Meigen says, "this species differs manifoldly in colour, size and design ;" which remark evidently shows that he included more than one species under the same designation. I find three very distinct though closely allied species, which may be named *duplicata*, *duplaris*, and *communis* ; the last will come under the second section, as the legs are partly pale.

I shall briefly describe the first species, and then point out how the two others differ from it.

S. duplicata : colour grey ; eyes of male sub-contiguous ; forehead and face very slightly prominent ; antennæ rather short ; arista long haired ; thorax with four longitudinal black stripes (the outer of which are interrupted at the suture) placed rather close together, and sometimes rather indistinct ; four dorsal bristles behind the suture ; scutellum marked with a fugitive brown spot at the base ; abdomen narrow and conical, whitish-grey, with four black spots, two on the second and two on the third segment, which vary in size and shape, being sometimes round and sometimes square or triangular ; in some specimens, an indistinct longitudinal dorsal stripe is also present between the spots ; wings clear with black veins, which are sometimes slightly clouded ; external transverse vein mostly straight, but more or less oblique ; internal transverse vein placed over the discoidal cell at about two-fifths from its end ; costal spine distinct ; calyptra yellowish-white ; halteres yellow ; legs black ; posterior tibiæ thickly clothed with short hairs on both sides, and having several strong bristles of uneven lengths on their outer surfaces. The female has the eyes widely separated by a grey-coloured frontal space, having a bifurcated black mark in the fore part. The external transverse veins are usually less oblique than in the male, and the posterior tibiæ have a slight rufous tinge ; it other respects it closely resembles the male.

Length of ♂ and ♀, 2 to 2½ lines.

The late Professor Rondani to whom I sent some specimens for his inspection, said that in his opinion it was the *S. duplicata* of Zetterstedt, but not that of Meigen. This species is not uncommon, I have found it upon the ground on pathways in fields.

S. DUPLARIS, Zett.

This species differs from *S. duplicata* by being rather larger and stouter in shape ; by having the abdomen more oval ; by the absence of the brown mark at the base of the scutellum ; by the lines on the thorax being narrower and more distinct ;

by the external transverse vein of the wings being less oblique; and by the internal transverse vein being placed very slightly behind the centre of the discoidal cell, which may be considered as the most characteristic point of distinction. I am not acquainted with the female of this species, and it is not described by Zetterstedt. The specimens which I have named *duplaris* differ in some respects from the description given of that species by Zetterstedt, so I am not certain that they are identical with those he described. Rondani, to whom I sent this fly, together with the last, said that he considered I had rightly named it *duplaris*, Zett. ("talem esse cogito"). This species is not common. The only specimens which I have seen were captured in the neighbourhood of Edinburgh.

S. COMMUNIS, Desv.

In general colour, form, and design, this species closely resembles *S. duplicata*, but it is generally rather larger, and always has the tibiæ more or less tinged with red or yellow. The females usually have the legs much paler than those of the other sex, but the middle and posterior tibiæ are sometimes quite testaceous, even in the males, though in the most common variety the legs are so nearly black, that the red tinge, which is then confined to the posterior tibiæ, may easily be overlooked, and this species may then be confounded with *S. duplicata*.

Macquart only knew the male, which he named *S. cæsia*. His description is good though short, and applicable to the black-legged variety; for he says, "Pieds noirs; jambes quelquefois d'un testacé noirâtre." R. Desvoidy described this species (especially characterizing the female) under the name of (*Mydina*) *communis*, which name I have adopted, as it has the priority over that of *cæsia*, and is also very appropriate, from the general diffusion and abundance of this fly. Apart from the different colour of its legs, *S. communis* differs from *S. duplicata*, in the males, by having the lines on the thorax usually more distinct; the external transverse veins of wings more oblique, and often more clouded, as well as sometimes sinuous; by the internal transverse vein being placed further back, being about one-third from the end of the discoidal cell, instead of two-fifths; by the antennæ having the third joint rather longer in proportion; and by the calyptæ being yellower and having the lower scale rather smaller than in *S. duplicata*. The females of *S. communis* cannot easily be confused with those of *S. duplicata*. They differ from the males of their own species, by having the thorax often indistinctly marked with the lines brown instead of black, and the spots on the abdomen small and also brown. The external transverse veins are also often much less oblique (this character varies much in both sexes), and the legs have the tibiæ and knees, as well as the ends of the femora, of the middle and posterior pairs, mostly distinctly testaceous, with a rufous tinge on the bases of the anterior tibiæ.

S. QUADRUM, Fab.

This is a very difficult species to define. It closely resembles some of the pale-legged varieties of *S. communis*, and I know of no decided characters by which the females of the two species can be separated. The males differ by the eyes being rather more widely separated in *S. quadrum* than in *S. communis*; by the thorax being less distinctly striped (sometimes almost unstriped) in the former than in the latter; by the wings in *S. quadrum* being tinged with yellow at their bases; being

without costal spine; having the external transverse vein straighter and less oblique than in *S. communis*; and the internal transverse placed nearer to the centre of the discoidal cell. The middle femora in *S. quadrum* are furnished with bristles along their whole under-surface, while in *S. communis* a few long bristles only are found near the base. This is not a common species.

S. DEPUNCTA, Fall.

In this species the basal two joints of the antennæ are often pale; the palpi are also generally rufous, though Rondani says they are black at the apex and red internally. This species may be recognised by having only three posterior dorsal thoracic bristles behind the suture, while there are four in all the other species that I know in this genus, with the exception of *S. 4-maculata* and *S. fuscata*.

S. FLAGIPES, Rond.

The males of this species closely resemble those of *S. depuncta*; but differ in being rather larger; in having four instead of three posterior thoracic dorsal bristles; and especially by having several very long straggling hairs or bristles on the outer sides of the posterior tibiæ; by the presence of which this rather rare fly may at once be recognised. I have not seen a female.

S. CONSIMILIS, Fall.

This species has the arista furnished with such short hairs, that it was placed by Schiner in the genus *Limnophora*; it has, however, all the characters of a *Spilogaster*.

S. FUSCATA, Fall.

This is an aberrant species, which differs from all the others in the genus by having only three central triangular spots, placed longitudinally on the dorsum of the abdomen, instead of two lateral ones on each of the middle segments, as in the other species. It is rare in England.

(To be continued).

ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

(Resumed from vol. xii, p. 276).

ADDITION OF THREE NEW SPECIES OF DELTOCEPHALUS TO THE BRITISH LIST.

I think I may safely say that the genus *Deltocephalus* is one of the most, if not the most, perplexing groups in this Order. The species are divided into little sections by external characters, which so closely resemble each other that at times it is difficult to separate them, and, as in the *Delphacidæ*, nothing but an examination of the genitalia will lead to any certainty as to their identity. Fieber describes 67 as European, and adds, in his "Katalog der europäischen

Cicadinen," 25 others as "Nicht gesehene Arten," viz.: of those described by Mulsant, 1; Dahlbom, 2; Kirschbaum, 13; Sahlberg, 9. Of one of Sahlberg's species, I have disposed, viz., *D. paleaceus*, as the specimens he sent to me were evidently only *D. Falleni*, Fieb. (see Ent. Mo. Mag., xii, 271, 11). Dr. A. Puton, in his list, published in 1875, enumerates 89 species, but these include the unknown ones of Dr. Fieber, and since then 4 others have been added, making the number 94. It is probable that some of the names may sink, but on the other hand, there may be several yet unknown which will fill up the ranks.

DELTOCEPHALUS FLORI.

Deltocephalus Flori, Fieb., Verh. z.-b. Ges., xix, 210, t. v, 25; *D. picturatus*, Fieb., Verh. z.-b. Ges., xix, 209, 23, t. v, 23; *D. obtusivalvis*, Kirschb., Cicad., 142, 117.

Pale brown. *Crown* white, with a brown triangular patch divided at the apex, outer margins of the patch blackish; posterior to this and before the eyes a short blackish streak adjoining the margin; from the anterior margin of the eyes and extending to the base a brown patch more or less distinctly divided transversely by a whitish line. *Pronotum* yellowish-brown, with a central longitudinal line, and another short one on either side, milky-white. *Scutellum* yellowish-brown, apex narrowly black. *Elytra* pale brown, nerves more or less milky-white; cells more or less broadly margined with black at the base and apex, and generally separated by a milky-white patch, thereby giving them the appearance of being spotted. *Legs* yellow; *thighs*: 1st pair broadly black at the base, and with a black spot on the inner side a little way before the apex; *tibiae* yellow, apex black, spines on the 3rd pair pale; *tarsi* black, basal half of the 1st joint of the 3rd pair yellow. *Abdomen*, ♂, underneath, black, margins of the segments narrowly whitish or yellowish-white; *genitalia*: basal flap triangular, black; plates black, margined with white, apices rounded, and leaving a slight notch between them, and with a few stout pale hairs on the outer margin.

Length, $1\frac{1}{2}$ line.

I have seen two specimens taken by Mr. Norman at Forres. 26th June.

DELTOCEPHALUS REPLETUS.

Deltocephalus repletus, Fieb. Verh. z.-b. Ges., xix, 208, 20, t. v, 20.

Yellowish-brown. *Crown* in front yellowish-white, posteriorly brownish, as broad across the anterior margin of the eyes as long, with four black spots on each side of the centre, viz., two triangular at the apex, and two somewhat trapezoidal in a line with the anterior margin of the eyes, between these and close to the margin is another minute black spot or streak; *face* black, with six or seven short, curved, narrow, pale yellowish striae on either side, somewhat clubbed next the centre. *Pronotum* posteriorly brownish, paler in front, with two minute black spots, more or less distinct or sometimes wanting. *Scutellum* yellowish-brown, with a brown triangular

patch at the basal angles. *Elytra* yellowish-brown, nerves paler; *clavus*: apices of the cells black, nerves very pale yellow; *corium*: anteapical and apical areas margined with black, the latter broadly exteriorly. *Legs* yellow; *thighs*: 1st pair black at the base, and with a more or less distinct band near the middle; 2nd, with a more or less distinct blackish line down the upper margin; *tarsi*: 3rd pair black. *Abdomen*: above black, posterior margin of the segments yellow; genitalia, ♂, upper portion yellow, plates black, sides yellowish at the base, and margined with stout yellow hairs. Length, $1\frac{1}{2}$ line.

Taken by Mr. Norman, at Forres. 26th June.

DELTOCEPHALUS DISTINGUENDUS.

Deltocephalus distinguendus, Flor, Rhyn. Livl., ii, 240; Fieb., Verh. z.-b. Ges., xix, 209, 21, t. v, 21; *Iassus (Deltocephalus) pseudocellaris*, Flor, Rhyn. Livl., ii, 547; Thoms., Opusc. Ent., i, 73, 64; J. Sahlb., Not. Fenn., xii, 314, 10.

Pale brownish-yellow. *Crown* pale, about as long as broad across the anterior margin of the eyes, with a more or less distinct brownish- or reddish-yellow triangular patch on each side of the apex, and two others somewhat square in shape, extending from about in a line with the anterior margin of the eyes to the base; *face* brown, with five or six yellow arched streaks on each side, slightly clubbed interiorly, and with a short yellow longitudinal line down the centre at the apex; *clypeus* and *lora* yellow. *Pronotum* yellowish, not so long as the head measured down the centre, with a faint channel in front running parallel with the anterior margin, forming a slight collar. *Scutellum* yellow. *Elytra* pale brownish-yellow; as long as, or a little longer than, the abdomen; nerves pale, apical cells narrowly black on the posterior margin. *Legs* yellow; *thighs*: 1st pair with two blackish spots or bands; *tibiæ* yellow, 3rd pair spotted with black down the outer and inner margins on the under-side, the largest spots on the outer margin, apex black, spines yellow; *tarsi*: 3rd pair black, 1st joint yellow. *Abdomen*, ♀, black underneath, sides and the two last segments yellow, except the middle of the posterior margin of the latter; posterior margin concave in the middle and on the sides, leaving a slight projection on each side of the base of the lateral lobes; lateral lobes brown, minutely spotted with yellow. Length, $1\frac{1}{2}$ line, barely.

I took two specimens of this species at Stockton Forest, near York, in August, 1865, and I forwarded them to the late Dr. Fieber, who returned them to me with the above name. Unfortunately, they got put on one side, and I only discovered them the other day.

Lee, S.E.: 9th July, 1881.

Additions to the Morayshire Hemiptera.—The two species of *Deltocephalus* undetermined, which I mentioned in my list of Morayshire captures, page 18, *ante*, Mr. Scott has returned to me as *D. Flori*, Fieb., and *D. repletus*, Fieb., both new to our lists. *Flori* had occurred at Forres, in 1878, but remained still undetermined.—GEO. NORMAN, Athole House, Pitlochry: 13th July, 1881.

Unusual abundance of Thecla w-album.—In a lane near Hemel Hempstead, leading from Felden to Bovingdon, *Thecla w-album* has appeared during the last few days in great abundance. About ten in the morning it begins to fly, fluttering and fighting among the boughs of various trees, hovering along the tops of the hedges, and settling on the *Umbelliferae* that skirt the meadows; the number is hard to estimate, but it amounts, probably, to some thousands.—B. PIFFARD, Hill House, Hemel Hempstead, Herts; *July 13th*, 1881.

Abundance of larvæ of Charæas graminis.—Mr. William E. A. Axon has sent us a note on this subject which was read by him at a Meeting of the "United Field Naturalists," at Greenfield, on the 19th June, and is reprinted from the "Manchester City News." It is to the same effect as our more condensed account in the July No. (p. 39 *ante*) with the following addition:—"The insects have been greatly diminished by the crows and gulls, and the rains have also helped in clearing the land of them." The birds doubtless did their part in diminishing the number of the larvæ, but the efficacy of the rains may be questioned; much of the apparent diminution of the abundance having, probably, been caused by the retirement of the full-fed larvæ under ground in order to become pupæ.—EDS.

Larentia didymata bred from Anemone nemorosa.—I found this larva in our glorious woods on the leaves of *Anemone nemorosa*: it eats little round holes in the surface of the leaf and when older it nibbles the edge of the leaf; from its similarity to the larvæ I had previously met with feeding on primrose flowers, and which I knew to be those of *L. didymata*, I suspected it might prove to be the same species, and this has now been established by the appearance of the moth in my breeding-cage.—PETER INCHBALD, The Lodge, Hovingham, York: *June 27th*, 1881.

Boletobia fuliginaria in London.—I am pleased to inform you that I have been fortunate in having had another specimen of *Boletobia fuliginaria* handed to me by our man, who took it in the same locality as the one recorded by me in 1879, on our warehouse door in Upper Thames Street, when the warehouse was opened this morning; it is a male, and in good condition.—J. R. WELLMAN, 219, Elm Park, Brixton Rise, S.W.: *July*, 1881.

Acidalia straminata, &c., in Yorkshire.—On the occasion of the Yorkshire Naturalists' Union's visit to Thorne Moor, near Goole, on Saturday last, July 9th, *Acidalia straminata* was taken by different members, but was first detected by Mr. Prest, of York. The species is quite new to the county of Yorkshire. Evidently, it was only just getting well out, as the specimens were in beautiful condition. Amongst other species we took at the same time were *Chortobius Davus*, in abundance; *Hyria auroraria*, not uncommon; *Macaria liturata*, *Scodiona belgiaria*, not uncommon; *Emmelesia alchemillata*; *Platypteryx falcula*; *Anarta myrtilli*, common; *Crambus margaritellus*, abundant on the damper parts of the moor; *C. Warringtonellus*, just appearing; *Phycis carbonariella* common; *Eupæcilia angustana*, also common; and many other species.—GEO. T. PORRITT, Highroyd House, Huddersfield: *July 13th*, 1881.

Re-occurrence of Diasemia literalis in Pembrokeshire.—It is highly satisfactory to be able to report that, after either disappearing or being overlooked for two years, *Diasemia literalis* has again turned up. The warm weather which we experienced towards the end of May brought it out in the dry pastures on the hill sides in the middle of the County. It was not at all common, but with long and close working my boy and I secured a score. They flew up, as usual, from any little tuft of herbage and settled again at the distance of a few yards, showing no apparent preference for any particular species of plant, and thus giving no clue to their food in the larva state. Indeed, both the food and the mode of feeding of this species are hidden mysteries. I have spent hours at a time when the larva *must* have been feeding, in closely scrutinizing the plants on their favourite grounds, examining every leaf and blade and even pulling up the plants, but without finding any indication whatever.

I think that the insect must be widely scattered, in suitable localities, through the County, for when working for *Tortrices* in a pasture only eight or nine miles from here, my son caught a specimen and showed it to me while in the net. We saw no more though we worked the neighbouring fields, and could only suppose it to be a stray in search of "fresh fields and pastures new," yet this would even indicate vitality and the migratory instinct in the species, rendering its early extinction far from probable. I heartily hope that it may spread further, and nearer, and so come within reach, for at present the journeys to its known localities are so long that it is hardly possible to manage more than one or two visits while it is out, and these visits are apt to be spoiled by wet or, still more, by wind, to which this delicate species is very sensitive.

As far as I can discover these pastures produce only the most ordinary and abundant kinds of plants, I do not know of any local species occurring in them. There are a few small thistles, ragweed, and knapweed, also rather stunted grass of good quality and scanty quantity, a few plants of *Lepidium Smithii*, Dandelion, Oxeye-daisy, and *Apargia* in plenty, patches of a short bluish *Carex*, and doubtless many other plants that I do not remember, but neither of these seems to suggest the probable food of *D. literalis*.—CHAS. G. BARRETT, Pembroke: 16th June, 1881.

Ennychia octomaculalis in Pembrokeshire.—To any one accustomed to collecting in English woodlands, the capture of *Ennychia octomaculalis* is a matter of small moment, but in a secluded corner of Wales, where it is hardly known, the occurrence of this lovely species is interesting enough.

In May of last year, when searching for larvæ among *Silene maritima*, *Ulex*, and *Solidago*, I was almost startled to find a dead and wasted specimen of this species lying on one of the *Solidago* plants, there being no previous record of its occurrence in the county. The locality was a steep undercliff formed by the action of sun, rain, and frost upon the cliffs of clay-slate, and causing them to break up into small angular fragments, and to form a soil highly suitable to the growth of the plants already mentioned. In the middle of May of this year I was again on the spot on a warm sunny afternoon, and, when in a place where it was hard to stand still, and harder to walk, while a sudden turn to strike at a moth might have resulted in a roll of fifty feet, a most exquisite newly-emerged specimen rose from a *Solidago* plant, and danced out of reach. Not, however, for long, for it was presently circum-

vented and secured, and in the course of two hours of climbing, creeping, and scrambling, half a dozen more were safely boxed, whilst others took an unfair advantage of the nature of the ground to escape.

It is interesting to see that in this isolated locality the species has by no means dwindled in size, or diminished in beauty, but on the contrary, is adorned with white spots of unusual size, the minute white dot usually present on the centre of the fore-wings having become a fair-sized spot, so that the name *octomaculalis* has almost become a misnomer.

A single specimen has since been found in a wood in the middle of the county, but this is of the ordinary form.—ID.

Eupæcilia Mussehlana, and other *Lepidoptera*, near *Pembroke*.—When working for *Diasemia literalis*, a fortnight ago, we had the good fortune to disturb and secure several beautiful specimens of *Eupæcilia Mussehlana*, a species which, from miscalculation of its time of appearance, or some other cause, I hardly saw at all last year. It hides closely in the short herbage, and is very hard to put up, and when disturbed, flies sharply a short distance, and then drops and hides itself, much in the manner of *Chrosis tesserana*. About sunset it flies more freely and higher, but only if the evening is warm and still. Such evenings are not frequent, and we have worked hard in several localities since, but with little success.

Sometimes we had a little diversion, *Pyrausta ostrinalis* would appear in abundance and wonderful loveliness, and insist on being captured; one evening, an excited ♂ *Bombyx rubi* plunged headlong into my net while I was looking at a small tortrix, and created no small commotion. He was acceptable, however, to the lad—being his first specimen—and served to reward him for catching me a fine *Mussehlana* a few minutes before. Another evening the search led us into a damp corner of a field, and a ♀ *B. rubi*, looking from its queer zigzag flight like an enormous ♀ *Hepialus humuli* flitted past me to fall a victim to the boy's ready net. There we found *Melitæa Artemis* asleep, sitting on the leaves of *Scabiosa succisa*, with antennæ held apart and rather forward, not in the usual fashion of sleeping butterflies. Little else was about except occasional specimens of the two pretty *Euclidia*, and *Penthina marginana*, looking white when flying, from the colour of its hind-wings.

The food of *Mussehlana* is still unknown, a rumour that it had been bred from *Pedicularis palustris* does not seem to have been confirmed. Prof. Zeller's suggestion of *Linum catharticum* seems as good as any other, for the plant certainly seems to grow wherever the insect occurs—and in most other places—but there has been, so far, no indication of larvæ found about it. I think the insect is a stem-feeder, but have no proof, nor any idea in what stem.—ID.

Captures of Coleoptera in the Isle of Wight.—During a short stay at Ventnor last April, I obtained a few good *Coleoptera*: the beetle I especially wanted to get was the very rare *Homalota princeps*, Sharp, which was recorded from Ventnor by Mr. E. Saunders last year (*Ent. Mo. Mag.*, vol. xvii, p. 116); of this I secured a single specimen, which Dr. Sharp has kindly confirmed for me. I again found *Lithocharis maritima*, and in fact nearly all the beetles mentioned by me in *Ent.*

Mo. Mag., vol. xvii, p. 235; the following others, however, are perhaps worthy of mention:—*Trechus lapidosus*, of which I found two specimens after a great deal of labour, the species certainly deserving its name. *Oxygaster nigrina*, Waterhouse (this last I have since found in some numbers in my hot-bed in Lincoln), *Diglossa mersa*, *Phytosus spinifer*, a *Myllæna*, which seems to be *intermedia*, but appears to have rather longer antennæ than that species, *Tachyusa unida* (very abundant among shingle below high-water mark), *T. sulcata*, *Bryaxis Waterhousii*, *Ptenidium punctatum* (rather common under sea-weed), and *Aleochara mæsta*; this last species is said to be common, but I have never found it so. At Luccombe I found a colony of *Æpys marinus* under one stone, but could not find another specimen anywhere. At Sandown *Otiorynchus ambiguus* was rather common; *Tychius lineatulus* was abundant at the roots of *Anthyllis*, and *Ceuthorrhynchideus nigro-terminatus* rather common on *Daucus maritimus*; I found one very large *Curculio* larva at the roots of *Anthyllis*, evidently that of *Otiorynchus ligustici*, which is found on the spot where I came across it. I could not, however, find the perfect insect.

Carabidæ, owing probably to the lateness of the season, were scarcer than I have ever known them.—W. W. FOWLER, Lincoln: July 12th, 1881.

Remarks on Dr. E. Joly's Cænis maxima.—Mr. Vayssié in Ann. Sc. Nat., Zool., Jan., 1881, p. 4, note, pointed out a mistake made by me some time ago concerning the places of origin of the tracheal-branchiæ in *Cænis*, which had led me to suppose that their positions in *C. maxima* differed from those of the corresponding organs in *Cænis* (typical). I had previously sent a note to the Magazine (published in the last February number) stating that the examples of *C. maxima* originally examined by me were all of them defective [all of them had lost the foremost pair of tracheal-branchiæ] and “that (judging from specimens in a better condition of preservation) the species was likely to be a real *Cænis*.” To save space no particulars were entered into; I was aware of the gill-bearing segments being the same in the insect as in the genus mentioned, but was not sure whether their gills corresponded exactly in structure, or not. For although differences in this respect were obvious in the specimens of *Cænis* and *C. maxima* before me, it seemed quite possible that they might be due to a disparity in grade of the nymphs, and that the gills of more mature nymphs of *Cænis* might become conformable to those of *C. maxima*; but specimens lately captured show that no such change takes place. *C. maxima*, therefore, does not seem to be a true *Cænis*; yet it does not necessarily follow that it is a *Tricorythus*. It would be safer to face the fact that the nymph is of undetermined genus, closely akin to *Cænis*,—possibly a *Tricorythus*. My anxiety to avoid jumping to conclusions rather than reach them through the course of actual observation is (it seems) liable to be misinterpreted. The aim of the February note was not (as one correspondent imagined it to have been) to cancel *Tricorythus*, but to advocate a suspension of judgment about the generical position of *C. maxima*, pending further investigations. In the absence of evidence sufficient to demonstrate its true rank, little would be gained by citing it as *Tricorythus* (?) *maximus* instead of *Cænis maxima*, when twelve months hence it might be possible to prove that *Tricorythus* is as distinct from it as *Cænis*. Merely giving names to an animal inadequately known does not further science to any material extent, but is often a hindrance to progress.—A. E. EATON, Cheltenham Road, Croydon: 6th July, 1881.

Limnophilus subcentralis, Brauer, in Scotland.—I have just received a ♀ of this from Mr. Peter Cameron, who captured it near Loch Awe.—JAMES J. KING, 207, Sauchiehall Street, Glasgow : July, 1881.

Review.

THE MICROGRAPHIC DICTIONARY, Edited by J. W. GRIFFITH, M.D., &c., and ARTHUR HENFREY, F.R.S., F.L.S., &c.

Fourth Edition, edited by J. W. Griffith, M.D., &c., assisted by the Rev. J. M. Berkeley, M.A., F.L.S., and T. Rupert Jones, F.R.S., F.G.S. Part i. John Van Voorst, 1, Paternoster Row : July, 1881.

The fact that the third edition of this standard work has been exhausted in about six years, and that the fourth edition is commenced, is a sufficient guarantee for its excellence and popularity ; it is also a hopeful sign, as indicating the great increase of students of Microscopy. The survivor of the two original editors is also to be congratulated on having retained the assistance of two of his colleagues connected with the third edition. We notice that several additional crowded plates (one of which appears in the first part) are promised, and that there is considerable modification in the text, especially as regards the bibliographical references (one of the special features of the work), so as to bring it up to date as closely as possible, thus maintaining its value as a book of reference. The whole is expected to be completed in about 21 thick monthly parts. The third edition occupied nearly 900 pages, with 48 plates. In the present we are promised 53 plates, and no doubt the text will be increased in proportion, so that the book bids fair to soon become a formidable rival of a well-known London Directory, so far as bulk is concerned.

ENTOMOLOGICAL SOCIETY OF LONDON : June 1st, 1881.—H. T. STAINTON, Esq. F.R.S., &c., President, in the Chair.

The Rev. E. N. Bloomfield was elected a Subscriber.

Mr. J. W. Douglas sent for exhibition living specimens of *Orthezia urticae*, Linn., from Darent Wood, *O. cataphracta*, Shaw., from Pitlochry, carded examples of a new species proposed to be called *O. Normani*, after Mr. G. Norman, who has recently found it at Pitlochry, and specimens of *Aleurodes carpini*, Koch, taken on 28th May, on hornbeam-leaves at Bexley Wood.

Mr. T. R. Billups exhibited *Crabro clavipes*, Linn. and *Molorchus minor*, Linn.

Mr. J. Sang exhibited some interesting British *Lepidoptera*.

The following communications were received :—Notes by Mr. G. E. Piercey on an insect troublesome to travellers in Turkestan, probably *Argus persicus*. Read :—The report of the Committee of the Society on *Phylloxera* on Vines in Australia ; A communication from the Colonial Office about an insect destructive to the eggs of Locusts in the Troad ; “On the *Tortricidæ*, *Tineidæ*, and *Pterophoridæ* of South Africa,” by Lord Walsingham ; and Descriptions of *Rhynchota* found in Australian and Pacific regions, by Mr. W. L. Distant.

A COMPARISON OF THE *PTEROPHORI* OF EUROPE AND NORTH AMERICA, SUGGESTED BY LORD WALSLINGHAM'S "PTEROPHORIDÆ OF CALIFORNIA AND OREGON."

BY R. C. R. JORDAN, M.D.

Lord Walsingham, in his "Pterophoridæ of California and Oregon," gives us the entomological result, as far as the plume-moths are concerned, of rather more than a year's wanderings in Oregon and California. This district may be roughly stated to be the West Coast boundary of North America, between the 46th and 34th parallels of latitude, answering, therefore, to an imaginary coast line extending from the middle of France to the north of Africa; it will be important for us also to bear in mind that all insects identical with European forms have, probably, been first filtered by passing through Asia, that is, taking it for granted, that the exodus has been from, and not into, our quarter of the earth.

Of course, in so short a time it must be utterly impossible to have exhausted the plumes of so large a district, but how well our author worked is shewn by the fact that thirty-nine species are described as natives, of which twenty-eight are new to science. It seems to me that it will not be a useless task to compare these plumes briefly with those of our own northern Palearctic region. The author commences with *Chrysocorys*,* our English *C. festaliella* occurs in Oregon, and six specimens were found; this little insect was before known to have a wide range, being recorded from Corsica,† but it was not previously known to extend into America. Clemens had, however, described a species from Pennsylvania, very nearly allied to *festaliella*, viz.: *C. erythriella*; its larva feeds on the fruit-racemes of the sumach; he thus describes it:—"It‡ tapers anteriorly and posteriorly, incisures deep, segments elevated in the middle, with a single row of transversely arranged epidermic points on each ring, each one giving rise to one or two rather stiff hairs, abdominal legs very slender and short, terminal placed posteriorly. Head with a few hairs, ellipsoidal, pointed, rather small and pale brown. The body is uniform dark green." A third American species, *C. felicella*, is here figured and recorded from Northern Oregon, in which the wings are "unicolorous fuscous, with a slight purplish tinge," the larvæ are again noted, as "small, green, and slightly hairy," they feed on *Orthocarpus*, one of the *Scrophulariaceæ*; the cocoon, which is also figured, is of white silk, but

* In the present paper, all reference to the true position of this genus shall be waived.

† By Herr Mann. *Tineina of Southern Europe*, p. 120.

‡ Papers of Dr. B. Clemens, edited by H. T. Stainton, p. 132.

otherwise, as in *festaliella* and *erythriella*. North America has, therefore, three known species of *Chrysocorys*: *C. festaliella*, Hb., *C. erythriella*, Clem., and *C. felicella*, Wlsm.

No specimens of the European genus *Agdistis*, nor of the North American *Scoptonoma* occurred to our author. *Cnemidophorus* also was not found.

The genus *Platyptilus* was freely represented, no less than thirteen species being figured, of which one, *P. Bertrami*, is common both to Europe and America; the other twelve being, as far as is known, exclusively American, and of these, ten are new to science. In the whole of Europe only ten, or, at the most, eleven species have as yet been discovered; in both cases the *Gonodactylus*-group, or that section where the anterior-wings are light coloured with a well marked dark triangle on the anterior costa, is far the most numerous.

If we include *P. grandis*, Wlsm., as more nearly allied to *P. nemoralis* than to *P. Bertrami*, eight species of this group are here figured, and the distinctions between them are admirably shewn in the illustrations; the two of special interest are *Platyptilus cardui** and *Platyptilus orthocarpus*, Wlsm.: we are so accustomed to look on the *Platyptili* as having larvæ which are internal feeders, passing their lives in the stems of composite plants, that this would have been to me, at least, part of the diagnosis of the genus, but in *P. cardui*, the larva is gregarious in the heads of thistles, and in *P. orthocarpus* there is a still wider divergence from the usual habit, the larva feeding on the buds and flowers of *Orthocarpus*, one of the *Scrophulariaceæ*; *P. cardui*, has another point of interest in the perfect insect approaching so very closely to *P. Zetterstedtii*, one of the chief differences being that the brown colour of the hind leg between the two pairs of spurs is wider than in *P. Zetterstedtii*; the habit of the larva is very distinct, *Zetterstedtii* being an internal feeder, inhabiting the stems of *Senecio nemorensis* (and, also, according to Heinemann, of *Solidago virgaurea*). Of the other *Platyptili*, three are almost unicolorous; one of which, *P. modestus*, Wlsm., approaches the genus *Mimeseoptilus* in a most remarkable way, not in structure, but in the arrangement of the spots and colouring.

The question of identity of *ochrodactylus* and *Bertrami*, and of their identity with the *Bischoffii*, of Zeller,† and of the *cervinidactylus*,

* It seems to me imperatively necessary to alter these "bastard names," but would it not be advisable for the alteration to stand in the name of the describer? I should write this *cardui* Riley (*dactylus*), and not *cardui* Zeller.

† All the *Pterophori* mentioned in Prof. Zeller's admirable paper, "Beiträge zur Kenntniss der nordamerikanischen Nachtfalter," are alluded to in this paper.

of Packard, is here entered upon; according to Lord Walsingham, Prof. Zeller "is now inclined to regard *P. Bertrami*, *ochrodactylus*, and *Bischoffii* as all belonging to the same species," so we may, therefore, safely regard *Bischoffii* as a synonym.

In a series of thirty specimens now before me, one (reared from tansy by Mr. Jeffrey, of Scarborough) has a most decided black spot* "just above and near the end of the split." This may clear the difficulty of Packard's *cervinidactylus*. It is quite possible that he described it from such a specimen, this is the brightest in my series, it has long falcate anterior-wings; at the other extremity is a type from Herr Mühlig, so light as to bear a striking resemblance to the figure of *P. petrodactylus*, Walker, in the plate before me; the anterior lobe is truncate, without any approach to the falcate form of the former specimen.

As to the identity of *ochrodactylus* and *Bertrami*, I confess myself quite unable to give a decided opinion, there seems to me no distinct line between the richly fawn-yellow specimens with falcate wings, and the pale straw coloured insects with the apex as square as in *gonodactylus*, the extremes of the series look most distinct, but the gradations are such as to make it very difficult to draw the boundary line. Mr. Stainton says,† "The best character is furnished by the hind legs; in *Bertrami* the tibiæ are slightly browned, but the tarsi are spotless whitish, in *dichrodactylus* the tibiæ are brown at the middle and apex, and there is a brown spot at the end of the first tarsal joint." Heinemann‡ draws the following distinctions: "very close to the former species, but the fore-wings less sharply pointed, all the brownish-red dusting paler, the spots before the division pale, often entirely wanting, the lines at the hind border finer; on the third feather of the hind-wing the black scales behind the middle are either less or wanting. The legs are yellowish-white, the tibiæ of the fore-legs are brown at the end, in the hind tibiæ the reddish-brown colour is equally spread from the middle to the end. It is widely diffused, the larva lives in *Achillea ptarmica* and *Tanacetum vulgare*." These distinctions, slight as they are, seem certainly inconstant in apparently fine examples; added to this, Heinemann makes the food-plant of the larva doubtful, for he says of *ochrodactyla*, "in the stem of *Tanacetum*

* Heinemann, in his description of *ochrodactyla* says, "vor der Spaltung zwei schwarzbraune, mehr oder weniger deutliche Punkte."

† Ent. Mo. Mag., vol. ii, p. 138.

‡ Heinemann, die Schmetterlinge Deutschlands und der Schweiz, Band 2, Heft 2, p. 784.

vulgare," of *Bertrami*, as quoted above, he says, "in *Achillea ptarmica* and *Tanacetum vulgare*."* It wants a careful description of the larvæ to decide the point.

(To be continued).

NATURAL HISTORY OF *MIANA EXPOLITA*.

BY WILLIAM BUCKLER.

With much gratification I am able to record the interesting discovery of the larva of *M. expolita*, and of its food-plant; a puzzle that had hitherto baffled all attempts at solution, has at length been unravelled by the assiduous efforts of Mr. J. Gardner, of Hartlepool, to whose kindness I have been indebted for the opportunities of studying the larva, both in the past and present seasons.

An attempt to rear this species from the egg was undertaken by the Rev. J. Hellins in 1873, when I received eggs from Mr. J. E. Robson, of Hartlepool; and in this way a record was made of the earlier stages, although but a single larva reached full growth, and that disappeared before the change to a pupa could take place.

The eggs laid on July 22nd, arrived on the 24th, 1873; the larvæ were hatched on August 3rd, and were put into a bottle at first with various grasses, out of which they seemed to choose the garden riband-grass, *Phalaris arundinacea*, var.; so, in the course of the autumn, they were placed on growing plants of this grass in a flower-pot and put out of doors; about the middle of October one was extracted from its mine in the stem of this grass, and figured by me; after hibernation it was again extracted at the end of April, 1874, and again figured and sent back to its food; but after this it disappeared, and so nothing could be published about it.

Mr. Gardner kindly sent me a full-grown larva and its food-plant (*Carex glauca*) last year, when I first bred the moth; and this year six larvæ, more or less mature, on the 31st of May, and the moths appeared July 13th to 19th. The plants of *Carex* were from six to eight inches in height, and the habit of the larva is to eat out the very heart of a plant working its way down to the white portion close to the root; and, as Mr. Gardner observed, when one plant has yielded its nourishment the larva migrates to another, and of this habit he had good evidence in some plants he found ravaged and deserted by their former tenants.

* There is now before me a specimen of *Bertrami*, bred by Lord Walsingham. The pupa was found on a stem of *Artemisia campestris* (there was no *Tanacetum* near), which may prove, therefore, to be another food-plant. It has, for *Bertrami*, remarkably pointed wings.

The egg was noted as being of globular shape, with soft glistening shell, scarcely showing traces of a sort of pitting all over; in colour a very pale straw-yellow.

The newly-hatched larva was of the regular *Miana* form, stoutest at third segment, whitish in colour, shining, with the head black, a dark plate on second segment, the usual dots very small and distinct, but dark in colour.

In captivity about the last week in October before hibernation, the larva is nearly or quite five-sixteenths of an inch long, of the true *Miana* figure, stoutest at the third and fourth segments, tapering a little behind, the head smaller than the second, is flattened and wedge-shaped towards the front and of reddish-brown colour, darker brown at the mouth, a broad shining semi-transparent plate on the second segment of the same colour as the back, which is lightish orange-brown, having a dorsal line of pale orange-ochreous with two short transverse bars about the middle of each segment; the sub-dorsal marking of the same pale colour is broadish and bounded below by the light orange-brown of the side, from which an upward curved streak intersects the marking at the first subdividing wrinkle and two shorter curves follow without much intersection; the black spiracle at the lower edge is followed by the pale orange-ochreous of the belly; a pale shining plate is on the anal segment.

After hibernation, at the end of April, the larva is nearly half an inch long, rather slender but still thickest at the thoracic segments; the design and colouring of the back and sides are much the same as before, but less well defined, as the brown of the back and sides is paler, and the belly has a faint watery greenish-yellow tint; the anterior legs are reddish-brown.

When found at large in the *Carex*, full grown, the larva is from half an inch to nearly five-eighths in length, of the same general figure as above, the segmental folds well defined, the subdividing wrinkles are deep on the third and fourth but moderate on other segments which are dimpled along the sides: the general ground-colour of the body is dull ochreous with a tinge of reddish; the back is deeply tinged with dull purplish-red on the third, fourth, fifth, sixth, seventh, and eighth segments; the dorsal line so inconspicuous as only just to be discerned as pulsating, the segmental folds are pale ochreous; the head is reddish-brown and shining, with dark brown mouth and black ocelli, a yellow-brown shining plate on the second segment has its front margin rather darker brown, the anterior legs of the same

colour; on the sides of the third and fourth segments is a triangular group of three large brownish-yellow horny spots, the ordinary tubercular dots on other parts of the body are very minute, each with a fine short bristly hair, and a faintly paler ring round its base; the spiracles black, the narrow plate of yellowish-brown on the fore part of the anal segment has its front margin rather bluntly pointed in the centre, that of the anal flap is of the same shining colour, flattened, but with a little raised ridge round behind, from which proceeds a few short bristly hairs, the ventral and anal legs tipped with brown hooks, the skin of the body is smooth but without gloss.

The pupa is subterranean but often lies only a short distance beneath the surface, and sometimes is scarcely buried amongst vegetable remains slightly held together by a few threads of silk; it is five-sixteenths of an inch in length, and of the usual *Noctua* form, stout across the thorax, the abdomen tapering and ending with two fine points: its colour for a time is very pale brown, afterwards dark brown, its surface shining.

Emsworth: *August 11th*, 1881.

TWO NEW SPECIES OF *ICHNEUMONIDÆ*.

BY E. PARFITT.

MESOLEIUS BRACHYACANTHUS.

Black, head wider than the thorax, mouth and palpi straw-yellow. Antennæ black above, ferruginous beneath, the basal joint very small, the second rather large, with an arched protuberance above. Thorax gibbous, smooth, shining black, very finely punctured; mesothorax with two short, lateral, concave spines; the metathorax with two raised lines crossing each other at nearly right angles, forming a St. Andrew's cross. Wings ample, with a faint smoky tinge, and beautifully iridescent; stigma and nerves testaceous, all growing paler towards the base, where they are pale straw-yellow, scale pale yellow, cellule 4-angled, irregular, oblique. Legs: anterior coxæ, and trochanters, the first testaceous-yellow, the second pale sulphur-yellow, the posterior black, with the apex of the trochanters pale sulphur-yellow. Anterior and median femora testaceous-yellow, posterior piceous, with a dark stain on the inside towards the base, where it is pale yellow. Anterior tibiæ and tarsi pale yellow, the apical joints of the tarsi fuscous or nearly black; posterior testaceous, the apex and tarsi nearly black. Abdomen black, cylindrical, but growing gradually larger towards the apex, finely, not deeply, punctured, the base of the first segment with two testaceous-yellow spots, all the rest have their apices pale testaceous.

Length, ♂, $2\frac{3}{4}$ lines; expanse of wings, $4\frac{1}{2}$ lines.

I have two specimens of this species, both males, they were captured in the neighbourhood of Exeter, 1879, and, up to the present, I have not seen another.

HEMITELES GYRINI.

♂. Head, thorax, and scutellum black, head somewhat square, wider than the thorax; mouth ferruginous, palpi pale straw-colour. Antennæ: black above, piceous beneath, the basal joint large, inflated, with a deeply impressed annulus near the apex, second joint pale yellow at the base; all densely pubescent. Thorax smooth in front, the rest clothed with a yellowish pubescence. Wings ample, hyaline, iridescent, stigma and nerves dark piceous, the base and scale pale yellowish. Legs pale reddish straw-colour, the claws of the anterior pair, and the intermediate and posterior tarsi dark fuscous. Abdomen elongate-clavate, peduncle black, the first three segments, and the base of the fourth red, the rest black, the first is slightly contracted in the middle, and depressed above, with two black dots, one on each side of the medial line, the whole rather densely pilose. Length, $2\frac{1}{2}$ lines.

♀. Head, thorax, and scutellum black, mouth black, prothorax with two deeply impressed lines ending at the base of the scutellum. Scutellum small, cordate, with a deep impressed line running round it. Antennæ, a fac-simile of those of the male, except that they are black; length, $1\frac{3}{4}$ lines. Wings ample, iridescent, stigma and nervures black, base pale, scale whitish. Legs bright red, anterior claws, middle tarsi, the base and apex of the posterior tibiæ, and tarsi, entirely black. Abdomen elliptical, peduncle shining black, with two longitudinal impressed lines, the first, second, and third segments red, the latter with a black fascia, the rest black, with their extreme apices whitish. Ovipositor black; length, $\frac{3}{4}$ line. Length, 2 lines.

This interesting species was bred from the pupa-cases of *Gyrinus natator*: the male came out either in the autumn of 1880 or early in 1881, as the pupæ were put into a box and were not looked at till the spring. The females were bred from pupæ collected this spring, and the insects came out in July.

I am indebted to the Rev. J. Hellins for these: he collected the pupa-cases of the *Gyrinus* on the heads of rushes and other water plants growing by the side of the Exeter Canal. I am somewhat at a loss to know at what stage the larva of the *Gyrinus* is attacked; I thought at first, when examining the male, it being so densely pubescent, that this species attacked the beetle-larvæ while still in the water, but now that I am acquainted with the female, and find that she is not so pubescent, I do not think this can be so. It is probable that the larva is attacked while ascending the stem of the plant, or, perhaps, when it has made itself a cocoon, as the female is provided with an ovipositor sufficiently long to pierce through the pupa-case.

The cases are made of the seeds or flower-heads, or any materials within reach of the little beetle-larvæ.

Exeter: August 4th, 1881.

A NEW SPECIES OF *EUPITHECIA*.

BY THE REV. H. HARPUR CREWE, M.A.

Some three years ago I received from Mr. Ficklin, of Keynsham, near Bristol, specimens of *Eupithecia* which he had bred from larvæ taken the previous September, in North Devon, feeding in the seed-heads of *Jasione montana*. At first sight I was disposed to consider them a variety of *Eup. castigata*, and in this view Mr. Buckler, who also saw the specimens, concurred. I forbore, however, to give any definite opinion till I had seen the larva. The same autumn Mr. Ficklin again took the larva in North Devon, and very kindly sent specimens to Mr. Buckler and myself. We at once saw that they bore no resemblance whatever to the larva of *castigata*, but though smaller and stouter, most closely resembled that of *Eup. campanulata*. As, however, the perfect insect was entirely distinct from the latter species, I felt convinced it must be a species new to Britain.

Through the kindness of Mr. McLachlan the perfect insects have recently been carefully examined by Herr C. Dietze, of Baden-Baden, who probably knows more about Continental *Eupitheciæ* than any one else.

He is unable to identify Mr. Ficklin's insect with any known species, and considers it new to science.

With the consent, therefore, of Mr. Ficklin, to whom the whole of the discovery is due, I propose to name it:—

EUPITHECIA JASIONEATA.

In general appearance it closely resembles *castigata*, but the ground-colour is a much paler ashy-grey. The dark central lunule of the front wing is round, not narrowed, and before the hind margin there is a very conspicuous, almost uniformly broad, acutely angled, pale whitish line, which forms the most distinguishing characteristic of the insect.

Description of the larva:—

Short and stout. Ground-colour pale ochreous-brown. Central dorsal line dull olive-brown interspersed with lozenge-shaped spots of a similar colour, becoming confluent and merged in the dorsal line on the anal segments. Head blackish. Spiracular line indistinct, yellowish on each side, slanting brown markings. Whole larva wrinkled and rough and sparsely studded with yellowish warts and hairs.

Feeds in September on seeds of *Jasione montana*. Perfect insect appears in May.

Drayton Beauchamp Rectory, Tring :

August 6th, 1881.

Entomological collecting on a voyage to the Pacific.—[The following very interesting extracts from a letter addressed to the Rev. W. W. Fowler, have been handed to us by this gentleman for publication, which we have great pleasure in doing.—EDS.]

The ship left Plymouth on September 28th, 1880, and, after a very rough and disagreeable passage, anchored off Horta, in the island of Fayal (Azores), on October 6th. As we remained here six days, making good some slight defects, I was enabled to land and look about me a little: on one occasion reaching the "Caldeira," a vast extinct volcanic crater in the centre of the island, the lip of which is 3200 feet above the sea, and five miles in circumference. The scenery of the island is very beautiful, and the vegetation luxuriant and varied in the extreme, the loose volcanic soil being of very great fertility: the hedges of *Hydrangea* were in their full beauty for hundreds of yards, one mass of pink, blue, and white blossom: and ferns in wonderful luxuriance and variety. I did not, however, find insects particularly numerous—about 20 species of beetles, mostly *Harpali* and other familiar Geodephagous forms, a *Calosoma*, a prettily little variegated *Elatér* related to *Cryptohypnus*, &c.; a large and curious Otiorynchid weevil, *Laparocerus azoricus*, &c. Small moths, mostly *Pyrales*, were individually numerous, the most abundant being *Scopula ferrugalis*. *Leucania unipuncta (extranea)*, so rare in England, was here the commonest *Noctua*: there were only three butterflies, *Pyrameis cardui*, *Pieris brassicæ*, and a *Satyrus*, like a small *S. Semele*: the latter appeared to occur only on the summit of the Caldeira.

Leaving Horta on the 12th, we visited the island of Flores, 120 miles to the westward, and stayed there two days, I went ashore once, but the weather was not favourable, and I got nothing that I had not found in Fayal. We finally left the Azores on October 16th, and reached St. Vincent, in the Cape de Verde Islands on November 1st, remaining here until the 6th. St. Vincent presents a very great contrast to the Azores, being as barren and forbidding in aspect, as they are fertile and luxuriant; the whole island looks like a vast heap of "clinkers" and brick-kiln refuse. Vegetation is scanty in the extreme, and what there is, is of a wretched weedy aspect. Two or three walks on shore yielded me a few Heteromorous beetles, two species of *Cicindela*, and a *Cleonus*, besides a nice series of a showy butterfly, *Danaüs Chrysippus*, var. *Alcippus*, and a few moths, of which the most noteworthy were *Deiopeia pulchella* (common), *Heliothis peltiger* and *armiger*, &c. We had a long and somewhat tedious passage of 30 days to Monte Video, our next port of call; the chief events which occurred to vary the monotony, were the capture of a couple of sharks (which were eaten by the ship's company, and pronounced exceedingly good; I tried a morsel of one, and found it by no means unpalatable), and the sight of a most gigantic cuttle-fish, floating dead on the surface of the sea, about 200 miles off the Brazilian coast. This creature (which resembled, on a colossal scale, the common calamary, or "squid," of the British seas) was at least 14 feet in total length, and weighed at least 3½ or 4 cwt.—a veritable sea-monster. We remained at Monte Video from December 6th to 12th. I found it a very interesting place, although the surrounding country is somewhat sandy and arid, with but few trees. I obtained a few species of beetles, including a conspicuous green *Phanæus* (a very fine genus of *Lamellicornes* related to *Copris*, &c.), some curious small *Heteromera* and weevils, &c. Butterflies were very numerous, as regards individuals,

but of very few species, and these were of a decidedly British aspect, with the exception of the large and conspicuous *Danaüs Archippus*. There are two species of *Pyrameis* (*Carye* and *Huntera*, the first being like a small and intensely coloured "Painted Lady"), a very handsome *Colias* (*C. Lesbia*), two handsome species of *Pieris*, a little dark *Thecla*, not unlike *T. pruni*, &c.; the moths appeared to be very few in number, but among them I recognised such familiar Britishers as *Stenopteryx hybridalis*, *Agrotis saucia*, and *Camptogramma fluviala*. Monte Video is a fine and well built town, of over 100,000 inhabitants, and altogether I was much pleased with my first sight of the New World.

We started again on December 12th, and, on the 23rd, entered the Straits of Magellan, and at 6 p.m. we were safely anchored off the little Chilian settlement of Punta Arenas or Sandy Point, 110 miles from the entrance. As it was necessary to coal ship, we spent Christmas day here, and did not leave until the morning of the 28th. I was thus able to enjoy, on Christmas day, a most delightful ramble about the surrounding country, which is very pretty, covered with a fine open forest of evergreen beech, and other trees, and abounding in beautiful wild flowers. Insects were numerous, and I obtained some 40 species of *Coleoptera*: among them were some that could scarcely be distinguished from familiar British coast species, such as *Brosicus*, *Pogonus*, *Harpalus*, *Bledius*, &c.: while others had a very exotic appearance, and would scarcely have been suspected to come from so high a latitude as 53° S. Among these were a fine Prionid, with flabellated antennæ much longer than the body; a large and grotesque, spider-like, black Acalloid weevil; a fine Brenthid, some large weevils related to *Otiorhynchus*, &c., and one or two *Heteromera* of a very Mediterranean type. The *Lepidoptera* were of much more British aspect; three species of butterflies were represented; a charming little *Argynnis*, like a miniature *Lathonia* above, but very different beneath (being entirely destitute of silvery markings), was abundant; less so was a *Colias* (*Fautieri*, Guér.), of which the ♂ is very like a small *Edusa*, while the ♀ closely resembles *Helice* in tint and marking; a pretty *Pieris* was rare. The moths were represented by several *Geometrae*, among which were four species of *Lobophora*, one very beautiful species reproducing, on the fore-wings, the colour and markings of *Agriopis aprilina*; a fine Fidomid, related to *Scoria dealbata*, but sharply marked beneath with white streaks on a coffee-brown ground; a *Scotosia*, like a small *certata*, sundry *Cidariæ*, &c. The *Noctuae* included a *Euclidia*, looking very like a mixture of our two Britishers, *mi* and *glyphica*; a *Hadena*, not unlike *glauca*, and an *Agrotis*, which, I think, is the widely distributed *A. fennica*.

Altogether I was very much pleased with my success at Punta Arenas, and would gladly have stayed some days longer. On leaving, we proceeded round Cape Froward, the southern extreme of the American Continent (a noble promontory), to the west end of the Straits, and then northward, through the passage known as Smyth's and Messier Channels, finally entering the Pacific Ocean, in the Gulf of Peñas, on January 8th. The scenery along the whole 600 miles of this route is most magnificent—I should say, unrivalled in the whole world: in some places the channel is less than 400 yards wide, the mountains rising sheer to the height of 3000 feet and more, and densely wooded to the water's edge; at frequent intervals, glaciers (sometimes many miles in extent) come down to the Strait, and the ice discharged from them is frequently a serious impediment to navigation. As we did not travel

during the night, but anchored before sunset in some one or other of the many excellent harbours, I had occasional opportunities of landing, and, it is needless to say, enjoyed myself immensely in the primeval Patagonian forest. The beauty and luxuriance of these woods is most wonderful: the chief trees are the evergreen beech (*Fagus betuloides*), the aromatic Winter's Bark (*Drimys Winteri*), a species of cedar, &c., the whole matted together with a most dense undergrowth, among which the wild *Fuchsia* holds a conspicuous place. It is like scrambling through a quickset hedge, to try and get about among these woods, and the open places are covered with a dense coating of spongy peat, saturated with water, and worse to cross than an Irish bog! The woods are a real Botanical paradise, being full of the most lovely wild flowers, while the profusion of exquisite mosses, lichens, fungi, and small ferns, which find a congenial climate in this land of never-ceasing rain, would simply drive a Cryptogamist wild with delight. Insects are, however, not numerous. I only got two beetles, a fine Brenthid weevil, and a chafer related to *Serica*: in moths, the genera were almost all British, the one best represented being *Eupithecia*, of which I found some half a dozen species, one or two pretty *Teniocampæ*, a *Cidaria*, very like *suffumata*, a *Scoparia*, a *Crambus*, a pretty olive-black *Camptogramma*, and one or two *Micros*. The great drawback to collecting, or even enjoying the glorious scenery, was the weather, which, although it was the height of summer in these southern latitudes, was most detestable—a succession of fierce storms of wind, rain, and sleet, the thermometer rarely rising above 50°. I do not think we had two consecutive hours without a shower after we left Punta Arenas, until we fairly got clear of the coast.

We arrived at Valparaiso, after a pleasant passage from the Gulf of Peñas, on January 15th, but we stayed here only four days, and the few insects I obtained were, with but one or two unimportant exceptions, identical with those I subsequently obtained at Coquimbo, where we arrived on January 21st, and remained until March 12th. This is a poor little town of about 6000 inhabitants, and the environs are very sandy and barren, with but a scanty vegetation in the best parts. Under irrigation, large crops of lucerne, &c., are grown, and these lucerne-fields produce many interesting insects. Some of them remind one forcibly of those found at home in similar places; thus *Colias Vautieri*, ♂, perhaps the commonest butterfly of the district, closely resembles our *Edusa*; *Pyrameis Carye* is a close mimic of *cardui*; a large sulphur-yellow *Callidryas* is a good imitation of our "Brimstone;" and some of the little skippers of the genera *Pamphila* and *Pyrgus* are very like our native species. The most conspicuous butterfly is a superb *Papilio (Archidamas)*, a rich purplish-black insect, with a curved fascia of golden-yellow spots across all the wings, which are from 3 to nearly 4 inches in expanse: this beautiful creature is common, even in the town and on board the ship. Its larva, a fat, stumpy caterpillar of a deep madder-purple colour, with a double row of orange-red tubercles on the back, is very plentiful on a creeping plant, a species of *Aristolochia*, and it emits, in a concentrated form, the very disagreeable smell of its food; the pupa is often found attached to rocks, &c. Another very beautiful, but scarce, butterfly is the extraordinary Satyrid—*Argyrophorus argenteus*—of which the male is entirely of a vivid silvery-white above, glistening in the sun, as it flies along, like a sheet of burnished metal; while the female is as dull as the male is brilliant, being entirely a dull sooty-brown. Unfortunately, I have been able to obtain only this latter sex, for although I have seen

four or five ♂, they have all managed to elude my pursuit. Among the moths, a fine *Deilephila* is conspicuous, in fact, almost the only showy insect to be obtained, though there are one or two pretty *Plusiæ*, with yellow hind-wings, besides our old friend *P. gamma*. The beetles are by no means as well represented as the *Lepidoptera*; though this is probably due to the fact that I was there at the very worst time of year, when everything is utterly dried up. A tiger-beetle, *Cicindela chilensis*, is the most abundant, as it occurs in myriads on the beach; one or two large black Heteromorous fellows must be exceedingly plentiful at certain times of the year, to judge from the number of dead ones strewed about everywhere, though living ones I found by no means numerous: some smaller, but very curious beetles of this group (*Heteromera*), a few good-sized weevils, a *Buprestis*, one or two ordinary Lamellicorns, a *Calosoma*, a ladybird, and one or two cosmopolitan *Necrophaga*, almost complete the list of beetles. The Order *Hymenoptera*, owing to the sandy character of the surrounding district, is remarkably well represented, both in species and individuals, at Coquimbo.

We left this port on March 12th for Callao, where we arrived on March 31st, having called in at about a dozen small ports on the way, but made no stay at any of them—a few hours, or, at most, a day, as we did at Iquique. The whole coast from Coquimbo northward, nearly to the equator, is a desert, simply appalling in its utter barrenness: for hundreds of miles you sail along a range of high hills, rising steeply out of the water, of red volcanic rock, covered for hundreds of feet up their sides with drifts of loose white and yellow sand, and without even a blade of grass to relieve the awful sterility. Occasionally one of the snowy peaks of the Andes is to be seen, but, as a rule, this grand mountain chain is shrouded in an impenetrable veil of clouds. The ports on this coast are wretched places, mere collections of wooden shanties, filthy and squalid almost beyond description; in many cases the water on which the inhabitants have to depend entirely, is all distilled from the sea, and is sold at the rate of about 3d. per gallon. I landed at Caldera (Chilé), Antofagasta (Bolivia), Iquique and Arica (Peru), but, of course, got no insects, except at the latter place, where a small stream of water supports a narrow strip of vegetation, a mere ribbon of green in the yellow waste of sand. Here I obtained a *Pamphila*, very like our *sylvanus*, in profusion; one or two little “Blues,” some small moths, a *Cicindela*, &c.

We arrived at Callao on March 30th, and have remained here ever since; we shall probably leave for Panama towards the end of the present month. Callao stands on the edge of an extensive plain, all but level, with a scarcely perceptible rise towards the city of Lima, eight miles distant, and 500 feet above the sea-level. Behind Lima commence the foot hills of the Cordillera, which are very rugged and barren: the snowy summits of the main range are to be seen on a clear day. The plain is covered with a tolerably luxuriant vegetation, by no means, however, of a tropical character in general: willows, bulrushes, reeds, and other familiar marsh plants, remind one very much of England, and only here and there a clump of bananas, or a field of sugar-cane, sweet potatoes, or “yuca,” a sort of Cassava (*Jatropha* sp.), give a tropical aspect to the scene. The little river Rimac, which flows through Lima, intersects the plain, and small running streams and ditches are met with in all directions, otherwise the roads and bye-paths are dusty to a most disagreeable degree: as you are aware, rain is all but unknown here. The insects,

with a few conspicuous exceptions, partake of the general temperate aspect of the vegetation. Beetles are singularly scarce: I do not think I have found twenty species in all, and have been obliged to concentrate my attention on the *Lepidoptera*. A *Tetracha*, a *Scarites*, one or two *Heteromera* and a *Pentodon*, all scarce, except the first-mentioned, are the only conspicuous *Coleoptera*. In butterflies, I have as yet obtained 39 species, whereof no less than 17 are *Hesperidæ*, nine of these belonging to the genus *Pamphila*, three to *Pyrgus*, one *Nisoniades*, two *Eudamus*—very large, brown, tailed insects; the other two are also conspicuous “skippers,” one measuring nearly two inches across, of a soft ochreous-brown hue, with darker fasciæ. There are eight *Theclæ*—some very pretty, but none as large as our *T. quercus*, and some very minute—a magnificent *Iolaus*, of a vivid blue colour above, widely bordered with black, the hind-wings with two tails. This beautiful insect, the ♂ of which is two inches across, is very common, and most conspicuous. The two species of *Polyommatus* respectively remind one of the European *Telicanus* and *Ægon*. The two fritillaries, *Agraulis moneta*? and *vanillæ*, most brilliantly spangled with silver beneath, are very conspicuous, and the latter is most abundant: the spiny larvæ of both species are to be found on “Passion-flower.” *Pyrameis Carye*, and a pretty red and brown ocellated *Junonia* (*J. Lavinia*) are both common, and I have reared a good series of the latter from spiny black larvæ feeding on that cosmopolitan plant, *Verbena officinalis*. The delicately-coloured white and grey *Anartia jatrophæ* abounds in damp places, but I have as yet been unable to find out anything about its earlier stages. The tropical American genus *Heliconius* is represented by a very beautiful black and yellow species, which abounds in shady places; an ochreous and black *Acraea*? is locally common, and its pale brown spiny larva, gregarious when young, is to be found in plenty on a shrub of the Order *Compositæ*. The large and showy *Danaïs Archippus* is very plentiful, and its handsome larva, ringed with yellow, white, and black, feeds on the troublesome but pretty weed, *Asclepias curassavica*: the pupa is a very pretty object, short and stout in build, of a delicate pale green, with a few small spots on the thoracic portion, brilliantly gilded; there is a transverse golden line, edged with black, on the abdomen. *Callidryas* is represented by two species, one, the common sulphur-yellow Coquimbo species, *C. Statira*?, the other is a very handsome insect, the ♂ being of a vivid orange colour, the ♀ varying from deep orange to greenish-white, and having a marginal series of small black spots. I have reared it from a long, bright green, shagreened larva, not unlike that of our “Brimstone” butterfly, feeding on a large Leguminous tree, the “Paqui” (I think this is the well-known West-Indian Locust tree, *Hymenæa Courbaril*: it produces immense flat legumes, containing many large beans surrounded with a sweetish white pulp, which is eaten and very much liked about here). Two species of *Pieris*, one of which, the common Callao butterfly, is remarkable for the constant colouring of the ♂ (chalk-white, with a black tip to fore-wings), and the extreme variability of the ♀, which is sometimes almost like the opposite sex, and sometimes almost entirely greyish-black, intermediates of all shades being found; and a little yellow *Terias*, as yet unique to me, complete the list of Callao butterflies.

I have lately taken two very fine species of *Sphingidæ* in a gentleman's garden, at flowers at dusk: one is a magnificent fellow, $4\frac{1}{2}$ inches in expanse, of a beautiful soft rich green colour, the hind-wings varied with violet, yellow, green, and rust-red; the other is not unlike a small *S. convolvuli*, but it has the hind-wings rusty-

brown, with a black border. There are two *Zygenids*: one (the commoner) is a very curious and pretty insect, entirely black, except a very large hyaline patch in each wing, and a large crimson blotch on the dorsal surface of the abdomen; the other belongs to the genus *Glaucopis*, and is a very brilliant creature, varied with crimson, steel-blue, and purple-brown, with the whole body glittering metallic-green. It flies high, and is difficult to catch, although not rare. The other moths are, with few exceptions, obscure dingy things, small *Botyda* being especially well represented. I have found two pretty *Notodontidæ* (one, a pale brown, Cymatophorid-looking thing, being beaten abundantly in the larval state from the Paqui tree. From the same tree I have bred (from a large yellowish-grey half looper) a fine *Erebus*?, nearly four inches in expanse, not unlike our *Mania maura* in aspect. *Noctua*, however, are decidedly scarce, and *Geometra* still more so, though among the latter are one or two charming little "Emeralds," one of them a perfect miniature of our *Phorodesma bajularia*, only about half the size. The other Orders of insects offer little that is remarkable: the dragon-flies, caddis-flies, *Hemerobii*, &c., are remarkably like our own species. There are one or two fine *Empidæ*, and other *Diptera*, and some large and conspicuous *Pompilidæ*, *Sphegidæ*, *Vespidæ*, &c., besides a superabundance of mosquitoes, sand-flies, and other equally (or more) objectionable insects. Scorpions, three inches and upwards in length, are occasionally met with under stones, but the district is remarkably free from snakes; I have only seen one, and he was a harmless species.—JAMES J. WALKER, H.M.S. "Kingfisher," Pacific Station: 25th May, 1881.

On the variable number of moults in larvæ from the same batch of eggs.—Last year I reared a few *Orgyia antiqua* from the egg, and what I then observed impressed me with the belief that the larvæ did not all moult the same number of times, but as I had not kept them separate I did not like to say anything about it in print. This spring I again found a batch of eggs, and securing the first four larvæ that were hatched I carefully separated and watched them, and made notes at once of every change that occurred, and these notes I now present in a tabular form.

	No. 1.	No. 2.	No. 3.	No. 4.
Hatched	24th May	25th May	26th May	26th May.
Moulted	4th June	2nd June	2nd June ...	2nd June.
Moulted	17th June	7th June	7th June	9th June.
Moulted	28th June	20th June	19th June	21st June.
Moulted	6th July	—	1st July	1st July.
Moulted	—	—	—	11th July.
Spun up	16th July	2nd July	13th July	22nd July.
Moth emerged...	5th August ♂	20th—21st July ♂	25th July ♀	4th August ♀.

They were all treated alike, except that No. 2 had rather a smaller bottle, and No. 4 a larger bottle to live in, than Nos. 1 and 3, but these last had two bottles of precisely the same size and shape; the food was whitethorn, and they seemed to prefer that which came from our garden well flavoured with "blacks" from the surrounding chimneys. I fancy I somewhat disturbed No. 1 in his first moult, and so retarded his growth, but this has caused no eventual harm, he has come out a finer moth than No. 2.—J. HELLS, Exeter: August, 1881.

Eupithecia jasioneata.—I had the pleasure of breeding a long series of this species in June, 1878, from larvæ collected in September, 1877, at Valentia, South West coast of Ireland, by my collectors who were staying there at that time. The larvæ were feeding on *Jasione montana*. I shall not be likely to send for it again, being in such an out of the way place. I sent several specimens away as vars. ? of *castigata*; at the time I bred them I had not seen the larvæ.—E. G. MEEK, 56, Brompton Road, S.W.: August 22nd, 1881.

Drepanula sicula.—I have this year had the pleasure of renewing acquaintance with this moth, and have been able to supply most of my friends with bred examples. Although not so fortunate as I had hoped, still, another season, I trust to be enabled to supply all correspondents.—WILLIAM H. GRIGG, 31, Cotham New Road, Bristol: August 1st, 1881.

Rare Lepidoptera at Deal.—During a month's stay at Deal this year, I have had the good fortune to take 34 fine specimens of the rare *Nola centonalis*, and during August I have bred 24 splendid *Ennomos alniaria* (= *autumnaria*) from eggs obtained by a friend from a female moth captured on a gas lamp at Deal, and sent to me last autumn. Fortunately I have been able to secure fertilized eggs, so that I may hope to be able to supply friends with a great prize, *genuine British alniaria*.—W. H. TUGWELL, 3, Lewisham Road, Greenwich: August, 1881.

The influence of rain in the destruction of the larvæ of Charæas graminis.—In your Editorial review of my short note on the abundance of *Charæas graminis* at Clitheroe, you question whether the rains helped to clear the land of them, and suggest that the apparent diminution may have been caused by the retirement of the full-fed larvæ underground, in order to become pupæ. That your explanation is partially true is extremely probable. My informants, however, held that the rain had considerable influence on the disappearance of the caterpillars, and the accuracy of their belief is strengthened by the observation of Kollar, who says, "Continued rains, particularly when they occur about the last time of the caterpillars changing their skin, are sufficient to destroy them entirely, as was the case in the Harz territory" (Kollar on Insects injurious to Gardeners, English translation. London, 1840, p. 138).—WILLIAM E. A. AXON, Fern Bank, Higher Broughton, Manchester: August, 1881.

The genus Oporabia.—With the help of correspondents an attempt has been commenced to arrive at some definite conclusion as to the number of species of the genus *Oporabia* found in Britain, from an examination of the early stages: but whilst giving a short account of the few results already obtained, much more extended assistance is asked for, in order that the questions may have a chance of being satisfactorily settled.

From eggs of *dilutata* obtained last autumn at Pembroke, by Mr. C. G. Barrett, a good many larvæ were reared: Mr. Hellins took a large number of larvæ at Exeter during the spring: and Mr. Kay, of Bury, did his best, when applied to, almost too late in the season, to obtain larvæ in his neighbourhood, and succeeded in providing a few.

The larva of *dilutata* is well known to vary considerably in the amount of its

markings, but nearly all the usual varieties were found among the examples from each of the above mentioned widely separated localities, and all agreed with the forms I have been accustomed to take at Emsworth, and with the descriptions furnished in Stainton's Manual and Newman's British Moths; I am still keeping the pupæ separate in different cages, and mean at the proper time to give the moths a full examination.

Mr. Kay, through Mr. Harwood's kind interest, also furnished a good supply of larvæ of *filigrammaria*, of which I had never before seen more than a single example: there does not appear to exist in this species anything like the amount of variation that we find in *dilutata*, and the larva, while exhibiting many points of resemblance to its congener, is abundantly distinguished from it, both in habit and in appearance.

Of any third species, so far, I have not been able to obtain an example, though Dr. Buchanan White some time ago, in his able paper in the "Scottish Naturalist" on the genus *Oporabia*, made a strong appeal for me: I wish now to repeat this appeal, and to ask Entomologists, especially in Scotland and the North of England, to try to procure for me during the autumn, a few eggs of all the species of this genus, which they are accustomed to take in their localities; particularly from those moths which fly in September.

Mr. Hellins is anxious to help in this investigation, as far as he can, by examining the eggs of each species under the microscope.—WILLIAM BUCKLER, Emsworth: July 13th, 1881.

Cosmia pyralina near Weybridge.—My friend Mr. McLachlan writes to me that, on August 2nd, he shook a specimen of *Cosmia pyralina* out of a plum tree in a garden between Weybridge and Guildford. The capture of this very local insect in a county from which it has not before been recorded, seems to me of great interest.—CHAS. G. BARRETT, Pembroke: August, 1881.

Notodonta cucullina.—Is it a common thing for *Notodonta cucullina* to be found outside Buckinghamshire? On Sunday, the 7th, myself and friend took four larvæ in a small copse on the road to the Gog-Magog Hills; and on Thursday, August 11th, we took nine, four full grown. I believe Mr. Greene took the pupæ at Tring, but I have seen no other localities except Halton.—T. E. SABINE PASLEY, Cavendish College, Cambridge: August, 1881.

Ichneumonidæ infesting larvæ of *Gyrinus natator*.—Last summer (1880), whilst fishing for carp in the Exeter canal, I was moved to collect some eight or nine small tough cocoons, which I found on the flags and rushes growing at the water's edge; most of these presently produced whirligig beetles, *Gyrinus natator*, but from two of them emerged, somewhat later, ichneumons.

Again this year, during the last week in June, I brought home a dozen of these cocoons, and bred (July 3rd—9th) six specimens of the *Gyrinus*, and afterwards (July 13th—27th) five ichneumons, not of one species only, but of three or four.

So far Mr. Parfitt has made out two species of *Hemiteles* (for one of which, being apparently unknown, he proposes the specific name *gyrini*), a *Pezomachus* probably *viduus*, and one of the small species, *Pteromalus* —, which was perhaps hyperparasitic upon one of the former.

I am quite ignorant of the habits of the larva of *Gyrinus*, but it seems strange to find it preyed upon to such an extent, and by such a variety of parasites: perhaps some Coleopterist may be able to suggest the stage at which the latter may be supposed to find the greatest facilities for depositing their eggs; I can hardly fancy the *Hymenoptera* going under water for that purpose.—J. HELLINS, Exeter; August, 1881.

Rare Diptera in the New Forest.—I have been spending a week in the New Forest, and have taken, on July 1st, a female of *Ctenophora ornata*, Meig., one of the rarest of our Dipterous insects; the only other specimen that has been found in Britain was a male taken by my father (in company with the Rev. W. Kirby), likewise in the New Forest, on the 7th July, 1821. There is an admirable figure of it in Curtis's "British Entomology." I also took a specimen of another rare fly, viz., *Henops gibbosus*.—C. W. DALE, Glanvilles Wootton: 9th July, 1881.

Sartena (Hagen, 1864) = *Neurorthus* (Costa, 1863).—The following remarks elucidate a point of synonymy concerning two genera (and species) of European *Hemerobiidæ* hitherto considered distinct.

In 1863 was published vol. i of the "Atti dell' Accademia di scienze fisiche e matematiche," of Naples, in which the second memoir is one by Prof. A Costa, intitled "Nuovi studii sulla entomologia della Calabria ulteriore." Amongst the insects described and figured is a new genus of *Hemerobiidæ* termed *Neurorthus* (*N. iridipennis*, Costa), p. 32, pl. iii, fig. 7. (This was foreshadowed, without name, in the "Rendiconti" of the same academy, vol. i, p. 125, 1862). In the same author's "Fauna del Regno di Napoli, Neurotteri, Aggiunte," p. 3, pl. xiii, fig. 4 (not fig. 3, as erroneously indicated in the text), 1871, the description and figure are reproduced.

In 1864 Dr. Hagen published in the "Annales Soc. Ent. de France," 4^{me} série, vol. iv, a paper, intitled "Névroptères (non Odonates) de la Corse," in which, at p. 41, the genus *Sartena* (*S. amæna*, Hagen) is characterized. It should be remarked that *Neurorthus* was omitted (and apparently overlooked) by Dr. Hagen in his "Hemerobidarum Synopsis Synonymica," 1866, although other genera and species noticed by Costa in his original memoir were included.

During a recent visit to Belgium I saw the types of *S. amæna* in the collection of my friend Baron de Selys-Longchamps, who generously presented me with one of them. These leave no doubt that *Neurorthus* is synonymous with *Sartena* (over which it has priority of one year), and in my mind there is also no doubt that *S. amæna* is identical with *N. iridipennis*.

But Costa, in a foot-note appended to his description of *N. iridipennis*, draws attention to *Mucropalpus fallax*, Rambur, Névroptères, p. 422, 1842, from Sardinia (*Mucropalpus*, Rbr., = *Hemerobius*, Auct.)—indicated by the author as an aberrant species (and of which I think the type no longer exists)—as closely allied to, if distinct from, *N. iridipennis*. According to the description, I am much inclined to consider it identical with *N. iridipennis* and *S. amæna*, and if this be proved, the insect will take the specific name *fallax*. If *N. iridipennis* (*S. amæna*) be proved to exist in Sardinia, I think there can remain no doubt on the point.—R. McLACHLAN, Lewisham: 15th August, 1881.

Reviews.

BIDRAG TILL NORDVESTRA SIBERIENS INSEKTFAUNA. COLEOPTERA. Insamlade under Expeditionerna till Obi och Jenessei 1876 och 1877. Förtecknade af JOHN SAHLBERG. I. Cicindelidæ, Carabidæ, Dytiscidæ, Hydrophilidæ, Gyrinidæ, Dryopidæ, Georyssidæ, Limnichiidæ, Heteroceridæ, Staphilinidæ, och Micropeplidæ. Med en Tafla. Stockholm, 1880, pp. 1—115, 4to.

This masterly work, published as a part of the "Kongl. Svenska Vetenskaps-Akademiens Handlingar" (Bandet 17, No. 4), consists of a synonymic enumeration (in Latin) of the species of *Coleoptera*, of the Families indicated, which were collected in the expedition to N.W. Siberia under Nordenskiöld. One new genus, *Nordenskiöldia* (*Staphylinidæ*) is characterized, and the number of species indicated is 750, whereof 78 are described as new. The author acknowledges the assistance of Dr. Sharp in working out the *Dytiscidæ* and that of M. Fauvel in the *Staphylinidæ*. The plate contains excellent figures of 18 species, of which 17 are new, including the *Nordenskiöldia glacialis*, of which 3 examples were found under pebbles, among ice, at the margin of a mountain rivulet. Independent of the interest that this work has as a record of the results of arduous enterprise in an inhospitable, slightly explored region, it has much value in the observations on little-known species, and especially in the synonymy generally, in which respect some of our British species are affected. The want of an Index is to be regretted; this, perhaps, may be supplied with part ii of the work.

HEMIPTERA ARGENTINA enumeravit speciesque novas descripsit CAROLUS BERG (Curonus). Bonariæ, Pauli e. Coni.; Hamburgo, Frederking et Graf. 1879, pp. 1—316, 8vo.

The increased and increasing attention bestowed upon the collecting and study of *Hemiptera* is shown in the number of general and particular memoirs devoted to these insects which appear continually in Transactions of Societies, Journals, or separately. The volume now under notice is a collection of papers in scientific sequence previously published in parts of the "Anales de la Sociedad Cientifica," during the years 1878 and 1879, and constitutes a valuable addition to the knowledge of the *Hemiptera* of the Argentine Republic. The number of species enumerated is 384, namely, 268 *Heteroptera* and 116 *Homoptera*, in which are included many that are new, and a few new genera. It might have been surmised that an author writing in the native country of the species treated of, and far from European centres of information, would be at great disadvantage; but it appears that M. Berg has had the assistance of the late Professor Stål and Drs. Reuter, Mayr, and Spångberg, so he has doubtless escaped errors otherwise probable or unavoidable, and this care on his part enhances the value of his work, which we trust will become as widely known as it deserves to be.

TRANSACTIONS OF THE NORFOLK AND NORWICH NATURALIST'S SOCIETY, presented to the Members for 1880—81. Vol. iii, Pt. ii. Norwich: 1881.

We have on several previous occasions had the pleasure of noticing the publications of this thriving and useful Society. The present part of the Transactions is in no way behind those that have preceded it from the point of view of general

interest, and most of the papers are valuable and lasting additions to Natural History literature. Entomology is not so well represented as usual, but there are notes by Mr. F. D. Wheeler and Mr. James Edwards. The former notices some of the rarer *Lepidoptera*, including *Margarodes unionalis*, taken at Yarmouth Denes: the latter records *Gastrodes abietis*, found by Lord Walsingham in spruce-cones at Merton.

THE BUTTERFLIES OF EUROPE: illustrated and described by Henry Charles Lang, M.D., F.L.S. Part i. London: L. Reeve & Co. 1881.

A good book in the English language, giving descriptions and figures of all the European Butterflies, was much wanted (we might say the same for the moths). Judging from Part i, Dr. Lang's work seems likely to supply the deficiency. The author proposes to briefly describe, and to figure, all the European species in about 20 monthly parts of 16 pages, and 4 plates each. The plates are drawn by the author, and coloured by chromo-lithography, and those in Part i (with the exception of one figure) strike us as excellent. The letter-press is occasionally open to improvement: for instance, why does the author father the terms "Palæarctic" and "Nearctic," as applied to faunistic divisions of the globe, upon Wallace rather than upon Sclater?

P.S.—We have since received Part ii, which is mainly occupied by the "whites," and which does not in any way cause us to change the favourable opinion expressed concerning Part i. Perhaps the least effective figure is that of *Aporia cratagi*. In the text not sufficient importance is given to the slight seasonal variations in the "cabbage-whites," on which our old Entomologists contrived to fabricate several species; an obvious slip occurs at p. 29, where a distinction is apparently drawn between "*Tropæolum*" and "*Nasturtium*," but not the natural one.

ENTOMOLOGICAL SOCIETY OF LONDON: *July 6th*, 1881.—H. T. STAINTON, Esq., F.R.S., &c., President, in the Chair.

The following were elected, viz.:—George Henry, Esq., of 38, Wellington Square, Hastings, Member; and Mr. A. S. Olliffe, of 36, Mornington Road, Regent's Park, Subscriber.

Mr. W. L. Distant exhibited a ♀ *Morpho* which he believed to be that of *Morpho Adonis* of which the other sex was already well-known in collections.

Miss Ormerod exhibited elm leaves, from Islay, attacked by a larva probably belonging to the Coleopterous genus *Orchestes*; also specimens of a saw-fly larva from Rochdale, which had done much mischief in the meadows; this Mr. Fitch thought was a species of *Dolerus*, and he had observed a similar larva damaging meadow-grass in Essex.

Miss Ormerod also exhibited two other larvæ, one from Clitheroe, probably of *Charæa graminis*, and the other from Marlborough damaging the wheat.

The Rev. A. E. Eaton showed a series of drawings by Mr. A. T. Hollick, of larvæ of *Ephemeridæ*, one of which appeared to have the power of adhering to stones by its ventral segments like a limpet.

The Secretary read the report of the Committee on the parasite of the Locust, which they determined to be a species of *Bombyliidæ*.

Sir S. S. Saunders showed the imago and larva of the *Bombylius*, and egg-tubes of the locust; also a young live locust that had hatched out a few days before the meeting.

The following papers were read :—

Species of *Euchroma*, by Dr. Sharp.

Larva of *Nycteribia*, by Baron V. Osten-Sacken.

Observations on the Homopterous genus *Orthezia*, with a description of a new species, by J. W. Douglas.

Lepidoptera collected on the Amazons by Dr. Trail, by A. G. Butler.

Papilionidæ from Ecuador, by W. F. Kirby.

Descriptions of New Asiatic diurnal *Lepidoptera*, by F. Moore.

3rd August, 1881.—R. MELDOLA, Esq., Vice-President, in the Chair.

Miss E. A. Ormerod exhibited several bottles of *Coleoptera* and *Hemiptera* from South Africa.

Mr. Kirby exhibited, on behalf of Mr. Swinton, a specimen of *Iodis vernaria*, and read a paper from him on its method of oviposition.

Mr. Fitch exhibited an ear of wheat shewing the skins of *Aphis granaria*, which had been preyed upon by *Allotria*.

The following papers were read :

Description of a new genus of Hymenopterous insects (*Dyscolethes*), by Prof. Westwood.

New species of *Rhopalocera* from South Africa, by Roland Trimen.

Descriptions of new genera and species of *Lepidoptera* from Japan (*Geometrites*), by A. G. Butler.

Description of the female of *Papilio Adonis* and of Neotropical *Pentatomidæ* and *Coreidæ*, both by W. L. Distant.

Descriptions of new Longicorn *Coleoptera*, by C. O. Waterhouse.

LIST OF LEPIDOPTERA OBSERVED IN THE NEIGHBOURHOOD OF GALLIPOLI, TURKEY, IN 1878.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Continued from page 32).

Lycæna semiargus, Rott.—Very common in certain localities, and fond of frequenting grassy slopes. Specimens from the neighbourhood of Gallipoli differ considerably from those I have seen from other parts of Europe: they are larger, the eyes below are larger, and they have two or three obscure orange spots beneath, situated at the anal angle.

Lycæna Cyllarus, Rott.—Common, and occurred in the same localities as the above, and so similar in habits and appearance that I did not at first detect I was taking two species.

Limenitis Camilla, Schiff.—This beautiful species was by no means uncommon wherever its food-plant occurred. It is very graceful in its habits, and it was a pretty sight to watch several of them flying to and fro in front of a clump of honeysuckle growing on the outskirts of some wood. Occasionally they chased each other to a considerable height, and disappeared amongst the topmost branches of the trees, and, presently re-appearing, would float down with an airy motion to the honeysuckle below, and after sailing lazily about, would settle on some prominent twig. There

were several broods during the summer, and their transformations were completed with considerable rapidity. The first butterfly was noticed on the 26th May, and on the 29th of the same month, I watched a female depositing eggs; and on the 27th June, happening to be on the same spot, I searched the plant and found two chrysalids, one suspended from the under-side of a leaf, and the other from a twig, and a larva, not yet changed, suspended from a leaf. On 2nd July, these two chrysalids produced fine butterflies. The suspended larva changed the next day (28th June), and emerged 5th July, being thus only a week in the chrysalis state. On 28th July I took full-grown and very small larvæ, the latter are quite black, but the former, as far as I could remember, did not seem to differ from those of *L. Sibylla*. The chrysalids are much angulated, and resemble, in a remarkable manner, a shrivelled-up honeysuckle leaf. The last butterfly was observed on the 21st September.

Vanessa c-album, L.—Common, and much larger, and of a paler hue than English examples.

Vanessa polychloros, L.—Common in the Ak-y-lar valley, sitting on the trunks of trees, and among willow bushes in the shade; but was not observed very often on the wing. First seen on 13th June.

Vanessa Antiopa, L.—Very common in some localities, in the larva state, throughout May and June. On the 13th of June I took about three dozen full-grown larvæ; they had all changed to chrysalids by the 15th, and on the 26th all the chrysalids produced butterflies, and they are the largest examples I have ever seen of this species. It is strange that, notwithstanding the abundance of the larvæ in the early summer, I never saw a specimen of the perfect insect on the wing.

Vanessa Atalanta, L.—Common, but not abundant. Larvæ frequently taken between united leaves of mallow (*M. rotundifolia*, L., and *M. sylvestris*, L.), and wall pellitory (*P. officinalis*, L.).

Vanessa cardui, L.—Abundant in all its stages. Imagos noticed depositing eggs on thistle heads on 24th May, and on the 15th June the butterflies were out in immense numbers, frequenting thistle flowers. Throughout September, October, and November, the larvæ were plentiful between united leaves of mallow.*

Melitæa Cinxia, L.—Common, first observed on 23rd May. Turkish examples are larger, and of a deeper colour than British.

Melitæa Phæbe, Knoch.—Abundant, but local: first noticed, 23rd May. This species varies considerably, and my Turkish examples differ from specimens I have from Switzerland; they are probably Staudinger's variety *caucasica*.

Melitæa trivia, Schiff.—Abundant. First observed 26th May. A weak-flying insect, and easily captured, inhabiting marshy pastures and open spots in woods near streams. During early morning, and again just before sunset, it delights to sit, with expanded and gently vibrating wings, on a flower-head, and when disturbed merely floats in a dreamy manner to the next flower. They were very quiet in their habits, and did not appear to quarrel with other butterflies, though they were continually jostled off the flowers by *Melanargia Galathea* and *Larissa*, or *Hesperia Actæon*. The larvæ of this pretty butterfly were exceedingly plentiful at the end of June, feeding in society on *Verbascum*. The following is a description of the larva:—Length, 10 lin. to 1 in.; ground colour grey, or bluish-grey, with minute black dots

* At Malta, in March, 1879, the larvæ were very abundant between united leaves of mallow.

and lines of black showing through; spines short, blunt, whitish, tawny at base, and ciliated with fine black and grey hairs, arranged in eights in a ring on all the segments, except the 2nd and 3rd, on which there are only six; the sub-spiracular spines are very minute; a narrow black dorsal line; an interrupted blackish sub-dorsal line; head reddish-brown, with a black dot on each side of the face; mouth black; legs very small, pale pinkish-grey; claspers of the same colour. Chrysalis short and stumpy; varies from pale bluish-grey to greyish-pink; a minute dorsal orange dot on each segment; a sub-dorsal row of orange dots, bordered above with black; a black dot above the spiracles, which are orange; all these dots are raised, especially the sub-dorsal row; six black dots on each wing-case; ten small black spots on head and thorax, and on centre of thorax; on each side of the dorsal line, is a crescent-shaped black line, bordered within with orange. The chrysalis is suspended by its tail to a pad of silk spun on the under-side of a leaf, twig, or stone, generally on the surface of the ground, and occasionally several larvæ spin a loose kind of web, in which they all change to chrysalids. The perfect insect appeared in about ten days, and there were several broods during the summer.

Melitæa didyma, O.—Abundant and more generally distributed than either of the other species of *Melitæa*. It was double brooded, the first brood appearing the 24th May, the second the 2nd August. It is an excessively variable insect, and the females vary far more than the males. As I write I have a series of 17 before me, and there are no two alike, and some of them are very beautiful, varying through different shades of bright fulvous-red to creamy-pink and greenish-brown.

Argynnis Daphne, Schiff.—On one or two occasions I noticed a fritillary flying among thick brushwood, but was unable to secure an example, and I believe it was this species.

Argynnis Lathonia, L.—Rare, I only captured two examples.

Argynnis Paphia, L.—Common in the valley of Ak-y-lar.

Argynnis Pandora, Schiff.—This grand species was rather scarce, and difficult to catch, as they were very strong fliers, and when once alarmed went off at a tremendous pace. They were very fond of the flowers of various kinds of thistles, and all the specimens captured were taken while they were regaling themselves on these flowers. There seem to be two broods, for the first butterfly was taken 13th June, and the last observed on 24th October.

Melanargia Galathea, L.—Very abundant.

Melanargia Larissa, H. v. *Herta*, H. S.—Very abundant in Ak-y-lar valley, and in the grassy plain near the Bulair lines, and very partial to the flowers of Scabious (*Scabiosa succisa*, L. and *columbaria*, L.). First observed on 4th June. A very variable insect.

Satyrus Hermione, L.—Very rare.

Satyrus Briseis, L.—Abundant. First observed 22nd June. Rather a troublesome butterfly to catch, for it was fond of alighting on bare ground among loose stones, where, closing its wings, it was difficult to see, and it generally rose just out of reach, and went off with its quick jerky flight. The males were far more numerous than the females.

Satyrus Semele, L.—Scarce and local.

Satyrus Statilinus, Hufn., var. *Allionia*, F.—Common on the downs between Gallipoli and the valley of Ak-y-lar. First taken, 30th July; males more numerous than the females.

Pararge Roxelana, Cr.—Common, but local, the first specimens occurring on 6th June, in the valley of Ak-y-lar, in a shady spot by the side of the stream, where I noticed them settling on the trunks, and among the branches of willow trees. When disturbed, they did not fly far, and always alighted on a tree, or branch, and invariably with their heads downwards. All the examples taken on the 6th June were males, and no females were seen until a week or ten days later. I discovered a locality nearer Gallipoli than Ak-y-lar, where they were plentiful, and I was able to note their habits. During the heat of the day they seldom flew, and were only to be obtained by beating bushes, or examining the trunks of trees; but, late in the afternoon, when it became cooler, they might be seen flitting slowly along hedge-rows, and occasionally pitching on a stone, and expanding their wings to the setting sun. The males were far more numerous than the females.

Pararge Mæra, L.—Scarce and local. Delighted to sit on the face of a rock, exposed to the full glare of the sun.

Pararge Megæra, L.—Abundant, and larger and brighter than British examples.

Pararge Aegeria, L.—Rare, only a few observed, and these, to my surprise, did not differ in any way from English specimens, for I had fancied that all south European examples possessed yellowish fulvous spots, as in var. *Egerides*, Stgr.

Epinephele Janira, L.—Very abundant, and varied considerably. First observed 23rd May.

Epinephele Tithonus, L.—Rare, 17th July, only one or two.

Cænonympha Pamphilus, L.—Very common. Turkish specimens are much larger, and differ considerably in other respects from English examples. Some I captured measure 1 in. 6 lin. in expanse, and the upper wings are broadly margined with brown; and the under-side of the hind-wings, instead of being brown or grey, are of a uniform pale fulvous, with a marginal row of metallic blue spots. Another variety, of which I only obtained one, is almost white, with broad black margins. There were several broods during the summer.

Spilothyrus alceæ, Esp.—Common throughout the district from April until November. Larvæ were found between united leaves of the common mallow, where they were not difficult to detect on the stunted little plants growing among the stones on the almost barren spots where the perfect insects delight to live. The first I observed on 3rd August, but, unfortunately, during my absence for a week at Constantinople, they were neglected, and, upon my return, I found them all dead and shrivelled up. These would probably have produced butterflies the end of August. The next batch of larvæ were not obtained until the end of October; they fed up and became full grown early in November, when they spun open net-work cocoons in the corners of the breeding cage, or among dead leaves and débris at the bottom, remaining as shrunk-up larvæ until the middle of January, 1879, when some of them changed to short chestnut coloured chrysalids, with prominent black eyes, and covered with a slight purplish bloom. The following is a description of the full-grown larva:—Length, 11 lin. to 1 in.; cylindrical, tapering towards

each extremity; slightly pubescent; head cordate, smoky-black, very distinctly separated from the second segment, which is very narrow, black, and bears three conspicuous gamboge-yellow wax-like spots, one dorsal, the other two sub-dorsal; whole of upper portion leaden-grey, thickly irrorated with transverse rows of black and white dots, but when the larva stretches itself in crawling, a faint fulvous yellow hue shows through, especially at the segmental divisions; an interrupted dorsal line somewhat darker; a pale sub-dorsal streak; spiracles minute, orange, with black pupils; ventral area smoky-black; feet black; prolegs and anal claspers smoky; lateral skinfold strongly developed. The young larvæ are smoky-black, with a small, but somewhat indistinct, black spot on each segment just below the pale sub-dorsal streak. These larvæ were terribly subject to the attacks of ichneumons.

Spilothyrus altheæ, Hb.—Common, though not quite so numerous as the preceding.

Spilothyrus altheæ, var. *baticus*, Rbr.—Two examples only.

Syrichthus sidæ, Esp.—This fine species was very rare, and only two were seen and captured, on 25th May, near the Bulair Lines.

Syrichthus serratulæ, Rbr.—Common, but rather local.

Syrichthus malvæ, L.—Common.

Syrichthus orbifer, Hb.—Common, but local, only occurring in a certain ravine near the Bulair Lines.

Syrichthus Sao, Hb.—Very rare, only one example.

Nisoniades Tages, L.—Common.

Nisoniades Marloji, B.—This species only occurred in one spot in the Ak-y-lar valley, where, on 3rd August, I secured a nice series, but, unfortunately, these were all destroyed while on the setting boards by minute red ants, while I was absent at Constantinople, and I had no opportunity of again visiting the locality.

Hesperia Thaumās, Hufn.—Abundant. First taken 1st June.

Hesperia Actæon, Rott.—Very abundant, the first appeared on 15th June, and they were very partial to flowers of different kinds of scabious.

Hesperia Nostrodamus, F.—I only obtained three or four examples, and they seemed to be difficult to get in good condition.

HETEROCERA.

SPHINGES.

Acherontia Atropos, L.—The larvæ of this species were very numerous throughout October and November.

Sphinx convolvuli, L.—Found a single larva on the 12th September, in a vineyard, on a plant of *Persicaria*. It turned to a pupa in a few days, and on 16th October produced a crippled moth.

Deilephila euphorbiæ, L.—Larvæ common early in July, and several perfect insects bred the following month.

Deilephila livornica, Esp.—Captured on several occasions flying before flowers in the bright sunshine.

Deilephila Alecto, L.—The larvæ of this fine species were very common in vineyards in September, and at times, I was told, they commit great ravages. The following is a description of a full-grown larva:—Length, 3 in.; when fully extended, 3 in. 6 lin.; head small and retractile within the second and third segments; fourth and fifth segments much swollen, giving the larva the appearance, when the head is withdrawn, of possessing a hood; remaining segments of almost uniform thickness; colour, a beautiful green, something the hue of a fresh vine leaf, irrorated more or less with darker green, and faint yellow-green spots, which seem to be placed just beneath, and show through the skin; dorsal line minute, dark green and pulsating; a pale yellow sub-dorsal stripe, bordered above by dark green; on the fifth to eleventh segments there is an oval-shaped ocellated spot, composed of an outer ring of pale yellow enclosing a bluish eye; these spots are most conspicuous on the fifth and sixth segments, but gradually die away towards the eleventh; their base rests on the sub-dorsal stripe; legs pale red; horn small, pinkish-brown, with black tip; spiracles minute, pale red. When full grown, the larva descends to the ground and spins a loose network cocoon amongst the débris on the surface, and in this changes to a pinkish-brown chrysalis. Some of these I brought to England in April, 1879, and they produced moths in June and July.

Smerinthus populi, L.—I noticed a number of larvæ of this species on some small poplar trees on 12th October.

Macroglossa stellatarum, L.—Very abundant. On 24th May, found a full grown larva feeding on *Galium verum*, and observed a female busily engaged depositing her eggs on the same plant. There was a succession of broods throughout the summer.

Macroglossa croatica, Esp.—This beautiful moth was common both in the perfect and larva stages. I first met with it on 17th May, and continued to see it almost every day until towards the end of September, so, no doubt there was a succession of broods. One day I noticed a female depositing her eggs while she hovered above a plant of Scabious (*Scabiosa arvensis*), and later on found the larvæ, of which the following is a description:—Length, 2 in.; cylindrical; head sub-ovate; dorsal area pinkish-purple; a broad, pale yellowish, sub-dorsal stripe, somewhat attenuated towards the anterior segments, and bordered with dark pinkish-purple above, runs from the second segment to the thirteenth, where it dies away at the base of the horn; spiracular and ventral regions pale pinkish-yellow, the yellow chiefly predominating below the spiracles, where it forms an indistinct and interrupted stripe; spiracles minute, deep orange; head, legs, and claspers pale pink; horn deep purple, faintly tipped with black, and with very small blunt white spines. The whole surface of the larva is thickly irrorated with minute white dots, which give it a somewhat roughened appearance. When full fed it becomes a beautiful magenta-colour, and the skin is smooth and glossy. A common variety of this larva is bluish-green, with a white dorsal line and indistinct whitish spiracular stripe, and covered with the same minute white dots. It spins a slight cocoon among dead leaves and débris on the surface of the ground, wherein it changes to a bright chestnut coloured shining pupa. These larvæ are terribly subject to the attacks of ichneumons, and I only succeeded in obtaining half a dozen healthy pupæ, from which but a single perfect insect was bred, in England, in June, 1879.

Ino ampelophaga, Bayle.—Common, flying among rushes on the sandhills near Bulair Lines.

In addition to the above, I obtained three other species of *Ino*, which, up to the present time, I have been unable to identify.

Zygæna pilosellæ (= *Minos*, Fuessl.), Esp.—Abundant, and particularly fond of the flowers of various kinds of thistles. Sometimes this and the following species were so thick on the flower-heads that there was positively no room for any other insect, and they would not budge one inch, although a score of *V. cardui* might be fluttering round them. These Turkish examples measure 1 in. 6 lin., whereas specimens I have from Ireland are barely 1 in. 3 lin.

Zygæna punctum, O.—Abundant with the above.

Zygæna filipendulæ, L.—Abundant, and differ rather from British types.

Zygæna sedi, F.—Very local, but common where it occurred. The cocoons of this species are white and glossy, and somewhat ovate shaped.

Zygæna lata, Hb.—This beautiful species was very rare, and only three were obtained.

BOMBYCES.

Lithosia caniola, Hb.—Very rare.

Emydia striata, L.—Common, flying freely in the hot sunshine. One example I bred has the fore-wings entirely pale ochreous, with two black dots just beyond the middle, and another, which was captured, has the hind-wings entirely black, with a very faint orange margin, this latter is probably the *var. melanoptera* of Brahm.

Deiopeia pulchella, L.—Scarce in the perfect state, but at Besica Bay the larvæ were very plentiful, feeding perfectly exposed in stubble fields on *Myosotis*, and, I think, *Anchusa* or *Lycopsis*, 10th September.

Callimorpha Hæra, L.—Common, but local, and a very brilliant insect on the wing.

Arctia villica, L.—Common, flying by day in the hot sun, 24th May.

Arctia purpurata, L.—Three beautiful specimens bred from larvæ found feeding on *Galium verum* near the Bulair Lines.

Arctia Hebe, L.—Only one taken at rest.

Spilosoma fuliginosa, L.—Larvæ feeding on *Verbascum*, 16th November.

Spilosoma menthastri, Esp.—Larvæ common in September and October.

Cossus cossus, L.—Larvæ common on apricot, almond, mulberry, and other trees.

Orgyia antiqua, L.—Males common, flying in the hot sun.

Porthesia chrysorrhæa, L.—Larvæ abundant, feeding on various shrubs.

Porthesia similis, Fuessl.—This species was double-brooded, and the larvæ were excessively abundant.

Ocnèria dispar, L.—Common, the males flying wildly by day.

Bombyx neustria, L.—Larvæ abundant.

Bombyx lanestræ, L.—Larvæ common, and perfect insects bred.

Bombyx trifolii, Esp.—Full grown larvæ scarce in May, but young larvæ abundant in September and October.

Saturnia pyri, Schiff.—The magnificent larvæ of this fine species were full grown at the beginning of July, and were plentiful on pear, plum, walnut, almond, quince, willow, and other trees, and from their large size, and the manner in which they stripped the branches they were feeding on, could be seen at a long distance.

Phalera bucephala, L.—Larvæ common.

NOCTUÆ.

Diloba cæruleocephala.—Larvæ common.

Acronycta aceris, L.—At rest on plane trees, 3rd August.

Acronycta psi, L.—At rest on various trees, and larvæ on apricot, 12th October.

Acronycta rumicis, L.—Larvæ common on bramble, sorrel, &c., 5th November.

Hadena ochroleuca, Esp.—Common, sitting on thistle flowers during the day.

Polyphænis sericata, Esp.—Scarce, flying before the flowers of the *Berberis* during the day.

Leucania congrua, Hb.—One example.

Cucullia verbasci, L.—Larvæ abundant.

Plusia gamma, L.—Abundant.

Heliothis dipsaceus, L.—Rather scarce.

Heliothis scutosus, Schiff.—Scarce, and difficult to obtain in perfect condition.

Heliothis armiger, Hb.—Common, larvæ feeding in flowers of various kinds of thistle.

Acontia lucida, Hufn.—Rare.

Acontia lucida, Hufn., *var. albicollis*, F.—Rare.

Acontia luctuosa, Esp.—Common.

Thalpochares ostrina, Hb.—Rare.

Thalpochares parva, Hb.—Rare.

Agrophila trabealis, Sc.—Common.

Leucanitis stolidus, F.—Rare.

Grammodes bifasciata, Petag.—Rare.

Grammodes algira, L.—Rare.

Catocala conjuncta, Esp.—Two examples.

Catocala hymenæa, Schiff.—One example.

Catocala conversa, Esp.—Common at rest during the day, on trunks of trees, walls, &c.

Spitherops spectrum, Esp.—The magnificent larvæ of this species were not uncommon on broom at the end of May, and their white cocoons, spun up among the terminal shoots, were most conspicuous. Mr. Stainton, in his *Manual of British Butterflies and Moths*, says that he nearly screamed with delight when he first saw the larva of *Calocampa exoleta*! I wonder if he has ever seen this larva, and if so, what effect it had upon him? for I think it is a far more beautiful and interesting creature, and I shall never forget the thrill of pleasure with which I first made its acquaintance. It seems a pity that such lovely larvæ should produce such dingy-looking moths.

GEOMETRÆ.

Phorodesma neritaria, H.-S.—One example.

Nemoria viridata, L.—One example.

Thalera fimbrialis, Sc.—One example.

Acidalia rufaria, Hb.—Common.

Acidalia subsericeata, Hw.—One example.

Acidalia ornata, Sc.—One example.

Pellonia calabraria, Z.—This pretty species was common on the downs between Gallipoli and the valley of Ak-y-lar, and flew readily in the day-time. The males far outnumbered the females.

Rumia luteolata, L.—A few examples.

Aspilates gilvaria, F.—Scarce.

Aspilates ochrearia, Rossi.—Common.

Aspilates strigillaria, Hb.—Common.

Sterrha sacraria, L.—Common and variable.

Lythria purpuraria, L.—Common.

Ortholitha cervinata, Schiff.—One example.

Ortholitha bipunctaria, Schiff.—Common.

Anaitis plagiata, L.—Common.

Cidaria fluctuata, L.—Common, bred.

Cidaria bilineata, L.—Common.

Cidaria sordidata, F.—Common.

Eupithecia oblongata, Hub.—Common, bred.

PYRALIDINA.

Cledeobia moldavica, Esp.—This striking species was excessively abundant in some localities on dry banks among withered herbage.

Cledeobia angustalis, Schiff.—Common.

Botys alborivulalis, Ev.—One example.

Botys cingulata.—Common.

Botys purpuralis, L.—Common.

Botys sanguinalis, L.—Common on the sandhills near the Bulair Lines.

Botys cespitalis, Schiff.—Common.

Botys ferrugalis, Hb.—Abundant.

Eurycreon sticticalis, L.—Rare.

Nomophila noctuella, Schiff.—This ubiquitous species was abundant.

Pionea forficalis, L.—Common.

Orobena frumentalis, L.—Scarce.

Margarodes unionalis, Hb.—Rare.

Crambus chrysonuchellus, Sc.—Common.

Pempelia semirubella, Sc.—Common.

Myelois cribrum, Schiff.—Common.

In addition to the species enumerated in this list, I have still several which I have not yet been able to identify.

Instow, North Devon: May, 1881.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(continued from page 65.)

5. LIMNOPHORA, Desv.

Gen. ch.—Eyes bare, contiguous or approximate in the males; arista slightly pubescent or bare; abdomen oval or conical, and always marked on the dorsum with four or six large triangular or sub-quadrate spots; alulets well developed, the under scale being longer than the upper; anal vein not reaching the margin of the wing.

1. COMPUNCTA, Wdm.

3. TRIANGULIGERA, Zett.

2. SORORCULA, Zett.

4. CONTRACTIFRONS, Zett.

5. SEPTEMNOTATA, Zett.

Several species of a widely different character have been included in this genus, which are only related to each other by having a very short-haired or nearly bare arista, and spotted bodies. Some of these, as *M. consimilis*, Fall., *M. litorea*, Fall., and *A. pertusa*, Meig., belong to the genus *Spilogaster*; while others, as *M. riparia*, Fall., and *M. triangula*, Fall., must be placed in the *Cænosia* group, the eyes being widely separated in both sexes. I have thought it better to restrict the name *Limnophora* to a small and natural tribe, of which *A. compuncta*, Wdm., is the type. All in this group are of a black colour, with entirely black legs; more or less fuliginous wings; and with the second and third (and sometimes the first) abdominal segments each marked on the dorsum with two large triangular or sub-quadrate lateral spots, separated from each other by a straight, longitudinal, narrow grey stripe.

The species are mostly confined to the northern and mountainous parts of Europe, being more common in Scotland than in England; and on the continent, finding their chief home in Scandinavia.

L. COMPUNCTA, Meig.

Of this, the largest species in the genus, I have not seen an English specimen; but several were given me some years ago by Mr. Verrall, which had been captured by him at Rannoch in Scotland.

L. TRIANGULIGERA, Zett.

I captured several males of this species on the borders of Loch Katrine, in August, 1874, where it seemed abundant.

L. CONTRACTIFRONS, Zett.

Zetterstedt has described several species which are so closely related to each

other, that it is very difficult to define them accurately. I have referred a single specimen to the present species, which I found in June, 1880, on very high ground on the borders of Rombald's Moor in Yorkshire.

L. 7-NOTATA, Zett.

This pretty little fly is the only one in the genus which is widely diffused, or at all common in England. I have found it both in Yorkshire and in the south. All the male specimens which I have seen belonged to the *b.* var. of Zetterstedt, having the alulets fuscous; a female which I captured together with a male in Askham Bog, near York, in September, 1880, had the alulets white, while those of the male were black.

6. HYDROPHORIA, Desv.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in male; arista plumose or sub-plumose; alulets of moderate size, with the lower scale longer than the upper; abdomen conical, without distinct spots, and with projecting sub-anal appendages in male; anal vein prolonged to posterior margin of wing.

Sect. 1—*Legs entirely black.*

- | | | |
|-------------------|--|------------------|
| 1. AMBIGUA, Fall. | \| | 2. DIVISA, Meig. |
| 3. CAUDATA, Zett. | | |

Sect. 2—*Legs partly pale.*

- | | | |
|--------------------------|--|----------------------|
| 4. CONICA, Wdm. | \| | 6. LINOGRISEA, Meig. |
| 5. BRUNNEIFRONS, Zett. | \| | 7. ANTHOMYIEA, Rond. |
| <i>coronata</i> ?, Zett. | \| | 8. SOCIA, Fall. |

This genus is closely allied both to *Mydæa* and *Hylemyia*. It differs from the former by the species having the anal vein prolonged more or less distinctly to the margin of the wing, and by the abdomen being usually conical rather than oval, and furnished beneath in the males with large sub-anal appendages. It is distinguished from *Hylemyia*, to which it has been united by Schiner, by its higher degree of organization; the alulets in the principal species being of considerable size, and always with the scales of unequal length; while in *Hylemyia* they are small, and the lower scale is always covered by the upper one; the abdomen also in the latter genus is usually cylindrical rather than conical.

H. AMBIGUA, Fall.

H. DIVISA, Meig.

These species have been confounded together, though they are really very distinct. This confusion has arisen from their bearing a good deal of general resemblance, and from having been too briefly and imperfectly described; so that the description of one will apply almost as well to the other. Fallén's *H. ambigua* is apparently more rare than Meig's *H. divisa*, though neither is common.

They may be distinguished by the following characteristics: the face is more prominent in *H. ambigua* than in *H. divisa*, and of a more brilliant silvery-white colour; the three longitudinal broad black stripes present on the thorax of both species, are separated by much more distinct white interspaces in *H. ambigua* than in *H. divisa*; and the sides of the thorax are of a more brilliant shining white colour in the former than in the latter. The scutellum is grey, with the apex shining black, in *H. ambigua*, while it is of an uniform grey colour in *H. divisa*. The abdomen has a longitudinal black dorsal stripe in both species, but it is much wider in *H. ambigua* than in *H. divisa*, and of nearly equal width in its whole length, extending over each segment to the apex. In *H. divisa* it is moderately wide over the first segment, but gradually becomes narrower, and terminates in a fine line, or becomes indistinct, at the hinder margin of the third segment. The apex of the abdomen is shining black in *H. ambigua*, but grey in *H. divisa*. The sub-anal appendages are very different in the males of the two species, affording very characteristic points of distinction; in *H. ambigua* they form a large projecting complicated hairy mass, under the third and fourth abdominal segments; while in *H. divisa* there are two long brown horny lamellæ, extending forward from the under-surface of the apex, and covering the rest of the male organs, which are much smaller and less hairy than in the former species. The third and fourth longitudinal veins of the wings slightly diverge from each other in *H. ambigua*, while they run quite parallel to each other in *H. divisa* as they approach the margin. The posterior tibiæ are ciliated on their outer and posterior surfaces with a number of long and short bristles of uneven lengths in *H. ambigua*, while in *H. divisa* there is a row of very short stiff hairs of equal lengths, extending along the whole outer surfaces of the tibiæ, and three long bristles in addition, one placed in the centre and one at each extremity of the tibia.

H. CAUDATA, Zett.

This species may be known from either of the preceding by its having two lateral tufts of hair, one on each side of the anus, on the under-surface, and another central tuft at the end of a projecting process, placed in front of the large hairy genital protuberance, beneath the penultimate abdominal segment. The abdomen is marked in the same way on the dorsum as in *H. ambigua*, but is more hirsute. The posterior tibiæ are armed as in *H. divisa*.

I captured several males of this species in 1874 on the margin of Lake Windermere; I have not met with it in any other locality.

H. BRUNNEIFRONS, Zett.

The female only of this species has been described; neither Zetterstedt nor Rondani knew the male. I found one female at Silverdale, Lancashire, in May, 1881, and have another which I found in a collection of *Diptera* made by the late F. Walker.

H. ANTHOMYIA, Rond.

This well-marked and pretty species has not been noticed by any author except Rondani, who found it rarely in Italy. Herr Kowarz has met with it in Austria, and it is generally diffused and by no means rare in England; so it probably occurs in other parts of Europe, but has been overlooked.

It differs from all the other species in this genus by having the sides and under-surface of the two basal segments of the abdomen more or less testaceous in colour, and slightly translucent. The abdomen is cinereous, and has a longitudinal, tapering, black dorsal stripe, as well as a series of transverse black marks at the base of each segment, which are dilated on each side of the central stripe, so as to form six semi-lunar-shaped spots. The legs have the femora and tarsi black in both sexes, and all the tibiae more or less testaceous. In some varieties the legs are almost black, and the yellow tinge at the base of the abdomen also indistinct.

The sub-anal appendages of the males are very complicated. Two long horny processes, with sharp points, extend forward from the under-surface of the anal segment, which are furnished with tufts of black hairs in the middle; they sometimes project downwards, the points being free and erected; at other times they are folded under two other membranous lobular bodies, which are placed under the penultimate segment and extend backwards.

H. SOCIA, Fall.

This is an aberrant species, the generic position of which is rather difficult to determine; the arista being short-haired, and the abdomen oval and depressed. Rondani (the latest authority on the *Anthomyiidae**) placed it first in the genus *Anthomyia*, but afterwards removed it into the present one, to which it certainly belongs. It is not common.

(To be continued).

ON CERTAIN BRITISH HEMIPTERA-HOMOPTERA.

BY JOHN SCOTT.

(Continued from p. 67).

LIBURNIA V-FLAVA, *sp. nov.*

♂. Yellow. *Crown* yellow, as long as broad from in a line with the anterior margin of the eyes to the base, anterior margin rounded, next the basal margin a distinct fovea on each side adjoining the eyes, the triangular space in front between the keels reaching to the frons: *face* yellow, slightly dilated below the eyes: *antennae* yellow, 2nd joint granulated.

Pronotum yellow, with a distinct but minute fovea in the centre on each side of the central keel, posterior margin arcuate: *scutellum* yellow, somewhat depressed at the base on each side of the central keel. *Elytra* yellow, reaching to the apex of the 6th abdominal segment, apex broadly rounded, nerves not granulated. *Legs* yellow: *claws* black.

Abdomen yellow: genital segment yellow, posterior margin viewed from the side nearly straight, viewed from behind broadish-oval, appendage yellowish-white, somewhat semi-oval, lower margin concave, upper margin inwardly on each side of the tube, and the lower angles very narrowly, black; processes yellow, V-shaped, upper margin narrowly margined with black and produced into a short tooth interiorly.

Length, 1 line.

♀. Unknown.

This species stands between *L. flavicola*, Flor, and *L. concolor*, Fieb. From the former it is easily distinguished by the different form of the

* Dipterologie Italicae prodromus, vol. vi Parma, 1877.

anal opening when viewed from behind, also by the shape of the processes; and from the latter by the want of the granulation on the nerves of the elytra, the want of the black margins of the appendage, and also the V- (not U-) shaped form of the processes, with their black upper margin.

I only possess a single ♂ example, but without date of capture or locality.

DELTOCEPHALUS NORMANI, *sp. nov.*

♂. Pale brownish-yellow. *Crown* pale brownish-yellow, with a whitish longitudinal central line, breadth across the anterior margin of the eyes about equal to the length; within the anterior margin a fine brown line extending from the apex almost to the eyes, at the base, on each side the central line, a small, somewhat square, brown spot, and adjoining the anterior margin of the eyes a paler, somewhat triangular one: *face* pale clear brown, with six to seven yellowish-white, short, slightly curved, transverse lines, and a short, pale, longitudinal central line at the apex: *clypeus* pale yellow: *rostrum* yellow, apex black.

Pronotum pale brownish-yellow, with a whitish, longitudinal central line; adjoining and running parallel with the anterior margin a pale yellowish-white, smooth collar, terminating in a line with the inner margins of the eyes, where it swerves into a straight line, terminating before reaching the lateral margins, posterior portion finely wrinkled transversely; posterior margin slightly concave, obtusely rounded at the extremities: *scutellum* pale brownish-yellow, with a short, shallow, transverse brown channel near the base. *Elytra* longer than the abdomen, pale brownish-yellow, nerves concolorous, central and the two inner apical areas milky-white. *Legs* pale yellowish or yellowish-white: *tibiæ*, 3rd pair pale yellowish, spines pale, set in black punctures: *tarsi*, 3rd pair dark brown, base and exterior margin of the 2nd and 3rd joints with a short whitish line.

Abdomen black, side margins very narrowly yellow; underneath, posterior margins of the segments narrowly yellow, posterior margin of the terminal segment concave; genital flap black, triangular apex narrowly rounded, margins yellow.

Length, $1\frac{1}{2}$ line.

♀. Similar in colour to the ♂. *Crown* with the markings less distinct than in the other sex. *Elytra* shorter than the abdomen: *clavus*, nerves dark brown.

Abdomen: upper-side black, last segment orange-yellow, basal margin of the latter black, sides with a few stout, short, yellow hairs. All the other characters as in the ♂.

Length, $1\frac{3}{4}$ lines.

I have compared this species with many of the late Dr. Fieber's in my possession, but cannot reconcile it with any of them; neither does it agree with any of the descriptions or figures given by him in his "Synopsis der europäischen Deltocephali," published in the Verh. z.-b. Ges. for 1869, pp. 201—221. In colour it resembles *D. socialis*, and is also otherwise like it, but without the dark margin to the apical areas.

I have seen three specimens taken by Mr. Geo. Norman (1 ♂, 2 ♀) on "high heathery land in Morayshire three years ago."

Lee, S.E.: 12th September, 1881.

DESCRIPTION OF THE LARVA OF *SCOPARIA TRUNCICOLELLA*.

BY G. T. PORRITT, F.L.S.

In the second week of August last year, I received two batches of eggs of *Scoparia truncicolella* from Mr. George Jackson, of York, and Mr. J. B. Hodgkinson, of Preston, respectively. They were large and glossy, at first pale in colour, but soon changed to very bright red. They hatched in about a week, but before doing so changed to lead-colour, the newly emerged larvæ were red with shining black head. I immediately placed them in a flower pot where was growing a layer of the ordinary moss, which grows so abundantly on the sides of our garden walks, and in the bottom of our grass lawns. In this moss they disappeared, and I have no note on them until the end of October, when I found they were tunnelling the moss with silken galleries in all directions, thus proving they had made themselves perfectly at home. I then left them alone, outdoors, until the end of March, when I saw they were again feeding, and it became necessary several times after this to replenish the moss as it became eaten away. They were full-grown at the end of June, when I described them as follows:—

Length, nearly three-quarters of an inch; head a very little narrower than the second segment, it has the lobes rounded and the mandibles rather prominent; both it and the frontal plate highly polished. Body of nearly uniform width throughout, tapering only at the anal extremity; it is rounded above but rather flatter ventrally; segments very clearly defined, the divisions being deeply cut all round: the skin has a rather tough appearance, the polished tubercles large and prominent, and as usual there are a few short, but not very noticeable hairs.

The ground colour is a dingy dark olive-brown; head and mandibles dark brown, the frontal plate nearly black. (When younger the head is pale brown, with the mandibles and frontal plate darker sienna-brown). A dingy black pulsating vessel shows distinctly as the dorsal stripe; the hairs and tubercles black. Ventral surface similar to the ground of the dorsal area, the legs black. There are no other perceptible lines or markings, and the larva altogether is a very dingy looking creature.

For the most part they kept to their silken galleries in the moss, but on damp evenings were to be seen crawling over the surface, and were then very lively, and would wriggle about like the larvæ of a *Tortrix*; they seemed much more active than the rather stouter larvæ of *Scoparia muralis*.

They changed to pupæ in the moss, and the first imago emerged on August 6th, and was followed during the next fortnight by about thirty more beautiful specimens.

Highroyd House, Huddersfield:

September 7th, 1881.

DESCRIPTION OF A NEW GENUS AND SPECIES OF *TENTHREDINIDÆ*.

BY W. F. KIRBY,

*Assistant in the Zoological Department, British Museum.*PARASTATIS, *g. n.*

Wings and body as in *Tenthredo* (true); antennæ 8-jointed, joint 3 nearly twice as long as joints 1 and 2 together; and joints 5 to 8 forming a club, tapering at both ends; joint 4 being longer than any of the remainder, and gradually expanded; and joint 8 ending in a point. The club is about as long as the first three joints together.

Parastatis indica, sp. n.

Head black, coarsely punctured, clypeus and labrum nearly smooth, with a few scattered punctures, clypeus incised, yellowish, as is also the outside of the mandibles at the base; labrum with a longitudinal impression in the middle. Thorax and pectus black, punctured, segments of the abdomen blue-black in front, and yellowish behind, the last two segments almost entirely yellowish above, and blue-black below. Four front-legs yellowish, their femora and tibiæ, and the first two joints of the middle tarsi, blue-black on the outside. Hind-legs blue-black, with yellowish coxæ and trochanters. Wings yellowish-hyaline, with a strong violet iridescence, especially over a dark shade at the tip of the fore-wings, extending over the greater part of the radial cells, and a little below them; there is also a dark shade filling up the greater part of the first medial cell. Costa and stigma ochraceous, the latter blue-black at the base.

Exp. al., 12 lin.; long. corp., 6 lin.

India (collected by Mr. Farr; precise locality not recorded).

A single female example is in the collection of Mr. F. Moore, to whom I am indebted for the permission to describe it. The insect is chiefly remarkable for the structure of its antennæ, which are quite different from any previously described form occurring among the *Tenthredinidæ*. A figure will shortly appear in Mr. C. O. Waterhouse's "Aid to the Identification of Insects."

British Museum:

September, 1881.

ON A NEW SPECIES OF *CHARAXES* FROM WEST AFRICA.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

We have recently received a small series of butterflies, chiefly *Charaxes*, from Accra, amongst which is the insect figured by Hewitson (*Exotic Butterflies*, vol. v, p. 40, pl. xx, figs. 22, 23) as the female of his *Charaxes cedreatis*.

As both figures of *C. cedreatis* evidently represent females of perfectly distinct species, and as the true male of Hewitson's *C. cedreatis*, ♀, is sent with the female by Mr. Carter, and proves to be an insect which has long stood in our collections as a probable variety of *C. Etheocles*, it will be necessary to give a new name to this species.

Charaxes Carteri, sp. n.

♀ *Charaxes cedreatis*, Hewitson, Exot. Butt., 5, p. 40; pl. xx, figs. 22, 23 (1876).

♂. Above, velvety-black, the primaries with diffused olive-brown border; a small sub-costal steel-blue spot beyond the cell: secondaries with a sub-marginal series of small greenish lunules with white centres; two bright blue sub-anal spots surmounted by white lunules; a sub-marginal lunated greenish line: fringe white-tipped; head chocolate-brown with four white dots, collar and tegulæ brown; thorax silky-black, abdomen velvet-black: under-surface exactly as in Hewitson's figure of the under-surface of the female, excepting that the oblique white belt (common to many females in this genus) is wanting, and the scarlet sub-marginal lines on the secondaries are less prominent. Expanse of wings, ♂, 2 in. 11 lin.; ♀, 3 in. 6 lin.

Accra (*Carter*).

Type, B. M.

Hewitson's colouring of the outer border of the secondaries above does not perfectly agree with that of our specimen, being represented as salmon-tinted, whereas ours is greenish-grey, but curiously enough this very discrepancy in coloration occurs in two males of *C. Etheocles* in the Museum collection.

The female *C. Carteri* is, unfortunately, slightly damaged, but this is explained by Mr. Carter; he says:—"I fear none of them are very perfect; I am obliged to get natives to make captures for me, and my last employé complained that the 'spank of the wings was too brisk,' whatever that might mean, on my complaining that he hardly ever sent me a perfect specimen."

British Museum:

September, 1881.

Drepana sicula.—Through a persistent search amongst its food plant since the early part of August, I am glad to say I have been enabled to secure larvæ of this species, which have safely pupated. I have likewise to report a fairly successful result from eggs obtained from moths bred at the end of May last, so perhaps correspondents who have not hitherto received this species from me will take heart at the announcement. I attribute my ill luck this summer to an undue forcing of the pupæ, which previously I had not attempted, as on an examination the moths were found fully developed.—WILLIAM H. GRIGG, 31, Cotham New Road, Bristol: 17th September, 1881.

Boletobia fuliginaria at Lewisham.—A specimen of this insect was taken in a cellar in Lewisham, on the 1st August, by a young man who works in my garden. The cellar had not been disturbed for some two or three years, and in a box in the cellar were two empty cocoons. Being in some doubt as to the insect, I sent it to Mr. Weir for identification, and this gentleman very courteously at once set my doubts at rest by assuring me of its genuine character. The insect is a female and in excellent condition, except the antennæ, which are slightly damaged. We tried

to tempt the occupant of the other cocoon with sugar, but I regret to say unavailingly.—FRED. W. SMITH, Hollywood House, Dartmouth Point, Blackheath, S.E. : 24th August, 1881.

Further captures of Boletobia fuliginaria.—Since writing to record the capture of a ♀ *Boletobia fuliginaria*, I am happy to say the *other two* I supposed to be in the cellar (having found their vacated cocoons), have both been captured. One has gone to Mr. Bond and the other I have. Both were females.—ID. : 27th August, 1881.

Boletobia fuliginaria in London.—I have the pleasure of recording the capture of the second specimen this season of *Boletobia fuliginaria*, which was taken in the same warehouse, on the morning of the 25th ulto., as the one recorded by me on the 14th July (*ante* p. 68) ; this is a female, and owing to its late appearance and probably to having been out some little time is a little worn, but otherwise quite perfect.—J. R. WELLMAN, 219, Elm Park, Brixton Rise, S.W. : September 6th, 1881.

Plusia orichalcea in Pembrokeshire.—I am so fortunate as to be able to record the occurrence of a specimen of *Plusia orichalcea* in Pembrokeshire. I was collecting on a fine afternoon about the middle of July last, in a wild spot close to one of the branches of Milford Haven, when I saw it fly from one plant of bracken to another, and secured it without difficulty. It has been submitted to Mr. C. G. Barrett who has obliged me with its name.—JAMES MALPAS, H. M. Dockyard, Pembroke Dock, S. Wales : 27th August, 1881.

Nonagria despecta in Pembrokeshire.—Being one day, early in August, in the extreme south-western corner of the county, and having half an hour to spare, I explored an attractive looking little strip of marsh lying below an extensive range of sand-hills near the sea. The place really *was* attractive, for in it *Anagallis tenella* actually carpeted the ground with its pale purple flowers, and *Samolus Valerandi* grew in plenty close by, with many common marsh plants, but attention was quickly drawn away from these by the appearance of a small whitish moth, flying like a *Crambus*, but with obviously broader fore-wings. This was *Nonagria despecta*—never before found, as far as I can ascertain, in any part of Wales, and, therefore, a most welcome discovery.

I worked over the ground—reviving the memory of old fen-land pleasures by tumbling headlong over a great “tump” of *Carex* into an abyss of black mud—and found that the *Nonagria* was tolerably common, though not plentiful, and its numbers were not greatly diminished by my visit.

At the same time I was much surprised to hear from Norfolk that *despecta*—which I used to see flying in hundreds, if not thousands, over the tall herbage at Ranworth Fen—has now become so scarce there, that hardly a dozen were seen in a week. This seems very extraordinary, they cannot have been exterminated by collectors, and no change in the condition of the Norfolk fens has taken place, and there is good reason to hope that this scarcity is only temporary and casual.

With it, in the little Pembrokeshire marsh, I found—as in Norfolk—*Acidalia immutata* and *Eudorea pallida*, but no other fen insect, not even *Crambus uliginosellus*, which certainly ought to have been there.—CHAS. G. BARRETT, Pembroke : 3rd September, 1881.

Singular variety of Pieris napi.—Among the insects brought back from the Norfolk fens is one which deserves a separate and special notice—a ♀ *Pieris napi*, entirely of a bright canary or sulphur colour. It is one of the most exquisitely lovely insects that I have ever seen, its colour agreeing almost exactly with that of *Gonopteryx rhamni*, ♂, only with the addition of the soft shading of black atoms always present in *P. napi*. I have some very striking specimens of the dark varieties of this species (*bryoniæ* and *sabellicæ*), but have nowhere seen anything approaching the present specimen in yellow colour.

It was caught in company with a ♂ of the ordinary colour in the fen, when the party were looking for *Papilio Machaon*, and Mr. Wheeler most generously sent it here for my collection.—ID.

Captures of Lepidoptera in the Norfolk fens.—My eldest boy having begun to make himself really useful as a young collector, has been encouraged in his exertions by an invitation from my friend Mr. F. D. Wheeler, to join in a boat-exeursion on the rivers, broads, and fens of Norfolk, and some of his captures and observations are worth recording. Very little collecting was done in the day time, but it is gratifying to find that *Papilio Machaon* shows no sign of dying out, its larvæ being to be found in plenty. At night a fair number of moths came to the attracting lamps, but not the abundance that has been seen in former years. *Lithosia muscerda* was scarce, not more than a dozen being taken, and *Nudaria senex* not much commoner, though both species formerly occurred in abundance on the same ground. As with *Nonagria despecta* I think this only a temporary falling off, there being no permanent change in the conditions of their existence, and that they will probably in future years be as plentiful as ever. *Lithosia griseola* and its handsome variety *stramineola* seem to have been as common as usual.

Nonagria brevilinea, which for the last two years had scarcely been seen, occurred sparingly, and some very good specimens were secured. Other *Nonagriæ*, as well as *Leucaniæ*, were very scarce, only one *neurica* and two or three *straminea* and *pudorina* being obtained, but *phragmitidis* was not uncommon. *Spilosoma urticæ* and *Simyra venosa* were taken but rarely, as also was the case with *Notodonta dictæoides*, *Ptilodontis palpina*, *Tethea retusa*, and *Celaena Haworthi*. *Apamea fibrosa* and *Epunda viminalis* were commoner. *Geometræ* were not plentiful, but a series of *G. papilionaria* came in most satisfactorily to take the place of the faded specimens in the cabinet. *Ennomos erosaria*, *Collix sparsata*, and *Lobophora sexalata* occurred but sparingly. Among the swarms of *Abraxas grossulariata* one was taken with its fore-wings smeared along the costal region with black, and among the almost equally common *Epione apiciaria* was one in which the angulated first line of the fore-wings was placed nearly in the middle of the wing instead of near the base, and the broadly purple second line almost met it. The lovely white variety of *Hydrocampa stagnalis* also occurred.

Schænobius gigantellus and *mucronellus* were found, though not in great plenty, and a few *Crambus paludellus*, one specimen being of a beautifully pure white.

Peronea Lorquiniana seems to have fairly established itself in the Norfolk fens, and several were taken. Its first discovery there was not more than three years ago. A few *Orthotania ericetana* and *Eupecilia Geyeriana* also occurred.

As a falling off in its former abundance is reported of *Liparis salicis* in some of

its old haunts, it may be worth while to record that it occurs locally but not uncommonly in the Norfolk fens, sometimes being of unusually large size.

The trip was a great success—fishing, boating, rowing, sailing, even shell collecting in the day-time, moth collecting at night—happy circumstances to be a boy, and have some spare time!—ID.

Curious variety of Hepialus humuli.—Of the very few insects that have fallen in my way this season, one seems worthy of record. It is a ♂ of *Hepialus humuli*, found sitting one afternoon on a hedge bank, just emerged. The apical third part of its silvery-white fore-wings was distinctly tinged with delicate pink, not following any line or pattern but simply an extension over part of the wings of the lovely pink colour of the apical cilia. When alive the patch of colour was very distinct, but it is fading and in all probability will before very long disappear.—ID.

The ravages of the larvæ of Charæas graminis in Thuringia.—On the 14th of June last, the foresters informed me that, in a certain district of the Oberghehren Forest, caterpillars, of which they sent some examples in spirits, had made great havoc in the pastures, and were so abundant that as one walked over the infested ground they crackled under foot. I recognised at once larvæ of *Charæas graminis*, and advised what could be done to prevent their ultimate increase, but I was unable to visit the place on the Rennsteig, about 2000 feet elevation, until the 28th June. The locality worst infected was a wood-clearing of about 90 acres; all the pasture had become entirely withered in consequence of the roots of the grass having been eaten by the caterpillars, whilst in other parts the vegetation flourished green. At the time of my investigation the greater part of the larvæ had become pupæ, the remainder were mostly ready to change, and only a few continued to feed. In a square foot I counted from 25 to 30 larvæ and pupæ, which gave for the 90 square acres 69,984,000 individuals. Single ones were also to be found in the adjacent clearings. I found school-children from the neighbouring villages busily engaged in collecting the larvæ and pupæ, and they received for them a mark per litre. Endeavours were made to stop the further spreading of the larvæ by making trenches into which the cattle were driven to trample on the larvæ and pupæ, and later on fires were to be made, whereby any developed moths should be destroyed. Altogether the forest officers did all that was possible to check the further spread of the insects; for this year in this place the grass was lost.

The moths first appeared on the 5th July; also their natural enemy *Ichneumon bucculentus*, Wesmæel; but no *Tachinæ*. It remains to be seen what will happen in 1882; whether larvæ will invade neighbouring pastures in destructive swarms, or whether in consequence of the attacks of their natural enemies and by climatic influences the number of the insects will be reduced to normal proportion.—A. GUTHEIL. (Condensed from the "Entomol. Nachrichten:" 1st September.)

Capture of rare Lepidoptera and Homoptera in Herefordshire.—On the 30th August I captured, in Herefordshire, a pair of *Cerostoma asperella* and a series of *Psylla visci*.—C. W. DALE, Barmouth, North Wales: September 2nd, 1881.

A new mode of collecting Coleoptera, &c.—[The following is an abbreviated

extract from an article on the results of an excursion in South Hungary]. I now mention a profitable way of beetle-hunting pursued by us almost daily. The method was entirely new to me, it may also be so to others, and may perhaps have similar results in other localities where railways go through woodland districts. The railway from Bogsan to Resicza runs continuously on the bank of the Berzava, often through forest; on the embankments the outer ledge of the rails is on an elevation, by which means the beetles will easily get over the rails and into the track, but their retreat is prevented by the concavity of the inner side of the rails, and they are caught in a trap, as in trenches with steep sides. In no other way can I account for the masses of bulky beetles in the said space; nor otherwise conceive for what purpose they had intentionally crawled between the rails. The greater proportion consisted of *Dorcadion athiops* and *D. rufipes*, *Dorcus parallelipedus* often in companies of 6 to 8 buried in the ground, *Gnaptor spinimanus* and other cursorial beetles, among which were *Carabus intricatus*, *C. repercussus*, also *C. Kollari* and *C. montivagus* singly. Further, *Herophila tristis*, *Acanthoderes clavipes*, *Hoplozia fenica*, *Mesosa curculionoides*, *M. nebulosa*, the last three scarce; but very plentifully *Timarchæ*, different *Chrysomelæ*, particularly *C. cærulea*, &c., were found. Standfuss made an eager raid on the cases of *Psychidæ* which had a predilection for hanging on the inner side of the rails.—E. VON BODEMEYER-HEINRICHAU (*in Entomol. Nachrichten: 1st September*).

Meligethes morosus, Er., a species new to Britain.—Among some doubtful *Meligethes*, which M. Fauvel kindly named for me some time ago, was a specimen of *M. morosus*, Er., a species not yet recorded as British: it apparently comes near *M. difficilis*, Heer, but is easily distinguished by its anterior tibiæ, which are much more evenly toothed than in that species; the teeth are much blunter, and increase in size to the apex, where there are two or three larger than the rest, though not conspicuously so, as in *M. difficilis* and other allied species; in shape it is shorter and more ovate than *M. difficilis*; its dark legs, as well as the teeth on the tibiæ, distinguish it from *M. ochropus*, to which it is somewhat allied by having its intermediate and posterior tibiæ strongly elbowed. I took my specimen in my garden in Lincoln, I believe out of a strawberry blossom.—W. W. FOWLER, Lincoln: *September 16th*, 1881.

Harpalus discoideus, F.—While collecting *Coleoptera* at Gravesend in July last, I took a single specimen of a *Harpalus* quite unknown to me. Mr. C. O. Waterhouse has kindly examined it for me, and pronounced it to be *Harpalus discoideus*.—H. B. PRIM, Leaside, Kingswood Road, Upper Norwood: *Sept.*, 1881.

Choragus Sheppardi in Warwickshire.—From the bark of an old ash stump near Bidford I took, in July last, a few specimens of *Choragus Sheppardi*. The stump was full of insects of various kinds, and amongst others were the following species of *Coleoptera*: *Homalium punctipenne*, *Cephennium thoracicum*, *Scaphisoma agaricinum* and *boleti*, *Carcinops minima*, *Cryptarcha strigata*, *Triphyllus suturalis*, *Diphyllus lunatus*, *Litargus bifasciatus*, *Dorcus*, *Sinodendron*, *Clerus formicarius*. In the *Hypoxyton concentricum* growing on the stump, I found larvæ of *Platyrhinus latirostris*, the perfect form of which I captured at the same place in May.—W. G. BLATCH, Green Lane, Smallheath, near Birmingham: *September 17th*, 1881.

Capture of Ceratocombus and Cryptostemma.—At the end of last July I found a specimen of *Cryptostemma aliena* amongst stones on the margin of Dowle's Brook in Bewdley Forest, and on a recent short visit to Matlock in search of *Stenus Guynemeri* and *Quedius auricomus* (both of which species I obtained) I found three specimens of *Ceratocombus coleoptratus*. They were on the under-side of bark lying on the ground in a damp place.—ID.

Notes on Hemiptera at Battle, &c.—During August I had the pleasure of working some parts of our district in company with four other local entomologists, Messrs. G. and H. Henry and E. P. and F. Collett. We confined our attention almost entirely to the immediate neighbourhood of Battle and to Dallington Forest, working principally at *Hemiptera* and *Coleoptera*. The larger *Hemiptera* were much more abundant than usual; besides plenty of *Tropicoris*, *Piezodorus*, *Picromerus*, *Myrmus*, *Gastrodes ferrugineus*, and larvæ and pupæ of *Pentatoma viridissima*, we took a few *Ælioides inflexus*, *Eurygaster maurus*, and *Corizus capitatus*, a considerable number of *Zicrona cærulea* and *Strachia festiva* and a few *Podisus luridus*. This latter was chiefly in the larval and pupal states, in which it is very handsome; one was observed sucking with great avidity a larva of *Piezodorus*, and by taking this hint and supplying them with such food, several were brought to the imago state. They seem, however, to be able to endure abstinence for a considerable time; one which remained without food for nearly a fortnight, at the end of that time performed its final change satisfactorily and seemed as lively as ever. This species was exceedingly local, being confined almost entirely to one damp corner of a wood close by a large pond near Battle. *Zicrona* was on one occasion found sucking *Adimonia caprææ*. *Cymus claviculus* occurred in all its stages under *Polygonum aviculare*, and another *Cymus*, which Mr. E. Saunders informs me is a variety of *C. glandicolor*, was extremely abundant in damp places by sweeping; we could not, however, associate it with any particular plant. In one damp spot *Monanthia humuli* was abundant, though there was but little *Myosotis*. *Dicypus globulifer* occurred commonly on *Lychnis diurna*, larvæ and pupæ being present as well as imagos; I had also taken it in the same spot in May. By sweeping under fir trees a few *Macrolophus nubilus* were obtained, though no *Stachys* was near, and on Scotch firs we were pleased to find plenty of *Acompocoris alpinus* associated with *A. pygmaeus*. *Sphagnum* and other mosses yielded a few *Ceratocombus coleoptratus*, and *Chilacis typhæ* was found in profusion at Ashburnham on bulrush-heads. *Nabis brevipennis*, *Anoterops setulosus*, and two developed *Stygnocoris rusticus*, by sweeping, a pupa of *Ploiaria vagabunda* under fir trees, *Coranus subapterus* and *Triphleps niger* on heath, and *Dictyonota stricknoca* on furze bushes complete the list. Among *Coleoptera* the best takes were three *Mordella fasciata* and a single *Haplocnemus nigricornis*, the firs also yielded in some numbers the usual *Coccinellæ*, including *C. ocellata*. Mr. W. Bennett has just shown me a fine specimen of *Lamia textor* from Fairlight, near Hastings.—E. A. BUTLER, Hastings: Sept. 17th, 1881.

Aculeate Hymenoptera at Hayling Island and Bournemouth.—I had two days' collecting at Hayling Island about the middle of last month, and made the following captures that I think are worth recording:—

Astata stigma, ♂.—One specimen on the Sandhills to the East of the Island. This is the second time only that the ♂ has been recorded from this country.

Oxybelus mucronatus.—Several ♂ and one ♀ on thistles, *Euphorbia*, &c., on the Sandhills to the West.

Oxybelus mandibularis.—One ♀ in the same locality as the last. This is the first recorded capture of the ♀ in England. Mr. Bridgman, Mr. Dale, and myself have all taken the ♂.

Prosopis dilatata.—This rare species was not uncommon on *Euphorbia* flowers on the Sandhills to the West. The ♀ was much more abundant than the ♂, I expect I was too late for the latter sex.

Epeolus productus, Thoms.—I took one ♀ of this addition to our British fauna on the Sandhills to the West of the Island. On getting home I find I have two ♂ and one ♀ of the same species from Littlehampton, taken in a very similar sandy locality. It is rather larger than *variegatus*, and has the labrum in front sharply bidentate, and the tubercles on its disc nearer the middle than in that species. It also has two distinct round spots on each side of the second, third, and fourth abdominal segments. I hope to describe this species more fully in a coming number with several other new species that I have to bring forward.

After leaving Hayling Island I went to Bournemouth for a fortnight, but did not succeed in capturing any of the great rarities for which the place is celebrated. Everything seemed very much parched up, and *Hymenoptera* were certainly scarce in places where one would have thought that they would have abounded. I do not remember ever seeing localities so promising and which yielded so little when worked. The following are amongst my best captures:—

Mutilla europæa.—One ♂ and a few ♀, the ♂ taken basking in the sun on a bramble leaf about 9 a.m. *M. rufipes*.—One ♀.

Pompilus chalybeatus, ♂ and ♀; several.

Harpectus tumidus.

Oxybelus mandibularis, ♀.—On the Sandy Cliffs near Boscombe.

Eumenes coarctatus, off *Rubus*.

Andrena pilipes, ♂ ♀, *A. austriaca*, ♀, *A. decorata*, ♀, off *Rubus*. *A. nigriceps*, ♀, *A. tridentata*, ♀, off *Senecio*. *A. fulvescens*, ♀, off *Crepis*. *A. argentata*, ♂, abundant, skimming over the ground in Alum Chine, but I could neither find the ♀ nor the parasitic *Nomada baccata*—I presume that I was too early in the year for the former.

Halictus prasinus.—Several ♀ on *Erica*, but I was too early for the ♂.

Dasypoda hirtipes, ♂ ♀.—Pretty common.

Cilissa tricineta, ♂ ♀.—Pretty common.

Bombus Schrimshirani, ♀ ♂.—Occasionally on the heaths and in the chines, but I was unable to get the ♂.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: August 11th, 1881.

A brief notice of Carl Ludwig Doleschall, the Dipterologist.—My interest in the author of the "Bijdrage tot de Kennis der dipterologische Fauna van Nederlandsch Indie" was aroused by my studies of the fauna of the Malay Archipelago; however, all that I knew, until recently, about the circumstances of Doleschall's life was derived from the following sources:

1. The brief datum in Hagen's Bibliotheca: "Died 1859, in Amboina, Physician in Java." 2. Two short paragraphs in A. R. Wallace's Malay Archipelago

(vol. i, p. 458, edit. 1869): "I had a letter of introduction to Dr. Mohnike, the Chief Medical Officer of the Moluccas, a German and a naturalist. He kindly offered me a room during my stay in Amboina, and introduced me to his junior, Dr. Doleschall, a Hungarian, and also an Entomologist. He was an intelligent and most amiable young man, but I was shocked to find that he was dying of consumption, though still able to perform the duties of his office. (p. 461) I enjoyed myself much in the society of the two doctors, both amiable and well-educated men, and both enthusiastic Entomologists. Dr. Doleschall studied chiefly the flies and spiders, but also collected butterflies and moths, and in his boxes I saw grand specimens of the emerald *Ornithoptera Priamus*, and the azure *Papilio Ulysses*, with many more of the superb butterflies of this rich island." Mr. Wallace's first visit to Amboina took place in December, 1857. 3. An interpellation by Mr. Ellenrieder in the Society of Natural History in Batavia (Natuurk. Tijd. Nederl. Indie, Batavia, 1859, Ser. iv, Deel vi, p. 239) about the fate of the scientific collections of Doleschall. He was told in reply, that an enquiry had been made, but without result.

Not long ago I had the good fortune to make the acquaintance of Dr. O. Mohnike, mentioned by Mr. Wallace in the above quoted paragraph, and it is to his kindness that I owe the details about Dr. Doleschall's life, which I am about to publish. Dr. Mohnike was Doleschall's chief and friend, and as such, is in possession of the most trustworthy data about him.

Carl Ludwig Doleschall was born on the 15th July, 1827, in Vag Jtjhelij in Hungary, and died in Amboina, February 26th, 1859, as "Officier von Gezondheid der tweede Klasse" (Health Officer of the second class, which answers to the rank of First Lieutenant). His father had been Protestant Minister in Hungary. Young Doleschall studied medicine in Vienna, but had, at the same time, to earn a living by giving lessons. Among his best friends, at that time, was Dr. Cajetan Felder, later Burgomaster of Vienna, known for his love of Entomology and his large collections of *Lepidoptera*. His son, Rudolf Felder (who also became afterwards known as a Lepidopterist, and died in 1871, at the age of 29) was one of Doleschall's pupils.*

After having obtained his Doctor's degree, Doleschall remained some time in Vienna, but left in 1852 for Holland, where, on the 4th of January, 1853, he found employment as Health Officer of the third class (Second Lieutenant) in the Military Medical Department of the Dutch East Indies. Sent to Java, he was at first employed in Ambarawa, later in Djokdjokerta, both military posts in Central Java. His residence in both places lasted two years and three months, whereupon he was called to Batavia, in order to pass an examination for a higher rank of service. Having been successful, he was promoted as First Lieutenant, and transferred, at his own request, to Amboina, in order to have better opportunities for his Entomological studies. The Chief of the whole Medical Department in the Dutch East Indies gave him a letter of introduction to Dr. Mohinke, the head of that department in the Moluccas, in which the latter was requested to allow Doleschall as much time as possible for his studies in Natural History. It was in Amboina that Doleschall wrote his three papers on *Diptera*, as well as those on *Arachnidæ*.

Doleschall was an excellent draughtsman and a good linguist; he could speak

* About R. Felder and his father, compare a notice by Dr. Schiner in the Verhandl. zool.-bot. Ges., 1872. Their connection with Doleschall is also mentioned.

German, Dutch, Hungarian, Slavonic, Latin, Italian, and Malay. He was very much liked by all who knew him for his amiable temper, and his early death from consumption excited universal regrets among the European population of Amboina.

The three works, mentioned in Hagen's *Bibliotheca Entomologiae*, are the only ones that he published about Entomology *sensu stricto*.

His other publications refer to different branches of Zoology, principally *Arachnida*, and will be found enumerated in Carus's *Bibliotheca Zoologica*, vol. ii, p. 1896—97. The following paper is not mentioned in Carus: Tweede Bijdrage tot de Kennis der Arachniden van den Indischen Archipel, with 17 plates (*Acta Societ. Sc. Indo-Neerl.*, v; 4to, pp. 60, with 17 plates; Conf. Gerstaecker, Bericht, etc., 1862, p. 236).

Besides the above, I have seen a botanical paper: Korte Karacterschets der Flora van Amboina (*Natuurk. Tijdschr. v. Nederl. Ind. Batavia*).

Of the three "Bijdrage" on *Diptera*, the third is without plates. At the sale of Mr. Snellen v. Vollenhoven's library at the Hague, in October, 1880, a volume of the Bijdrage was sold, in which to the third part were added original, unpublished, coloured drawings by Doleschall. The volume was bought by Mr. Puls in Ghent. I possess a copy of these figures (44 in all), beautifully executed for me at the Hague, with the owner's kind permission.

Doleschall did not leave any Entomological collections of importance. I have been told that the little there was has been sent to his only Entomological correspondent, Dr. Felder, in Vienna. At any rate, the only *Diptera* of Doleschall's collecting, that I know of, are now in the Imperial Entomological Museum in Vienna.

I deem it a pleasant duty to express to Dr. Mohnike of Bonn, my sincere gratitude for the pains he has taken in satisfying my enquiries on the subject of this paper.—C. R. OSTEN-SACKEN, Heidelberg: July, 1881.

ENTOMOLOGICAL SOCIETY OF LONDON: Sept. 7th, 1881.—H. T. STAINTON, Esq., F.R.S., &c., President, in the Chair.

The President read a letter from the Colonial Office thanking the Society for the Report it had transmitted on the parasite of the locust in the Troad.

The Rev. A. E. Eaton exhibited a nymph of *Euthyplocia*, and read some notes respecting it.

Mr. E. A. Fitch exhibited a large mass of small Chalcids belonging to the family *Encyrtidae*, of which hundreds (if not thousands) had emerged from a single larva of *Zeuzera aesculi*. He also exhibited pupæ and perfect insects of *Drosophila cellaris*, the larvæ of which had been found feeding in the pickled cauliflowers in a bottle of picalilli pickles. In another bottle of pickles the same larvæ had been found feeding in a great variety of pickled substances. He also exhibited galls of a new species of *Cecidomyiidae* on the flowers of *Galium mollugo*, from Dorking; galls of *Cecidomyia foliorum* on leaves of *Artemisia vulgaris*; and galls of an unknown species found on *Thalictrum flexuosum* by Dr. Power in Scotland.

Mr. Fitch also exhibited an abnormal pupa-skin of *Bombyx mori*, from Mr. Kay Robinson, from the anterior end of which were protruding what appeared to be the posterior segments of two moths; indeed, it was said that the female had actually deposited several eggs. He also exhibited living larvæ of a species of *Dolerus* from *Equisetum* stems.

Mr. Billups exhibited six *Ichneumonidæ* new to Britain, including *Lissonota aneuris* from Weybridge, *Lissonota anomala* from Wickham, *Limneria litoralis* from Woking, *Pezomachus xylochophila* from Rainham, and *Pezomachus geocharis* from Deal.

Sir S. S. Saunders exhibited larvæ of the Dipterous parasite of the locusts of the Troad, and read a letter from Mr. Calvert, from which it appeared that the locusts had been entirely destroyed by these parasites throughout an area of 80 square miles; the Dipterous parasites were themselves subject to the attacks of a parasite of the family *Chalcididæ*.

Mr. C. O. Waterhouse exhibited a common house-mouse from Peru, from a large swelling on the side of which had been obtained a larva of one of the *Æstridæ*. Mr. Verrall observed that no instance had been previously recorded of any *Æstrus* attacking the house-mouse. Mr. Waterhouse also exhibited three new species of *Coleoptera* from Sumatra.

The President exhibited specimens of *Charæas graminis*, received from Mr. F. S. Mitchell of Clitheroe; they had been bred from the larvæ which had swarmed so in that neighbourhood (see *ante* p. 39).

The following papers were read:

Dr. Baly, "Descriptions of uncharacterized species of *Eumolpidæ*."

Mr. A. G. Butler, "List of Butterflies collected in Chili by Thomas Edmunds."

Mr. C. O. Waterhouse, "Descriptions of some new *Coleoptera* from Sumatra."

A COMPARISON OF THE *PTEROPHORI* OF EUROPE AND NORTH AMERICA, SUGGESTED BY LORD WALSINGHAM'S "PTEROPHORIDÆ OF CALIFORNIA AND OREGON."

BY R. C. R. JORDAN, M.D.

(continued from page 76.)

To pass to the next genus, *Amblyptilus*, a pretty new species with a white ground to the wings is described under the well-chosen name of *Amblyptilus pica*; and *cosmodactylus* is described as very common and very variable. In England *cosmodactylus* is certainly quite distinct from the *acanthodactylus* of Hübner, which is a much more abundant insect, and by no means very variable. I must, in some years, have seen fifty specimens in an afternoon on *Ononis*, near the Warren at Dawlish, and all of them with the rich reddish hue on the forewings, utterly different from the almost greenish tint of *cosmodactylus*. The larva of *acanthodactylus* feeds on strongly smelling plants of various Orders: *Ononis*, *Pelargonium*, *Stachys*, and others; *cosmodactylus* generally affects the columbine; on the Continent, intermediate forms seem to occur. Our author, from the figures, did not meet the true *acanthodactylus* in his travels.

Of the pretty but difficult genus, *Oxyptilus*, four species are recorded, one of which only is new; one, *O. periscelidactylus* (not met

with in Oregon or California), was first described by Fitch, and two others, *O. delawaricus*, and *O. nigrociliatus*, by Zeller in his "Beiträge zur Kenntniss der Nordamerikanischen Nachtfalter." The other, *O. ningoris*, Wlsm., is new, and seems to me more allied to *O. didactylus* than to any other European species.

Only one *Mimeseoptilus* is here mentioned, which is a new species, *M. exclamationis*, Wlsm. Prof. Zeller, however, in the work before mentioned, records two others from Texas, *M. semicostatus* and *M. pumilio*, this last seems an especially interesting little species, being only the size of *Lioptilus microdactylus*, and distinguished from all other *Mimeseoptili* "by the short and broad fore-wings, which are of a fawn-brown colour, marked with three very distinct black spots." The species described by our author is nearly allied to *M. coprodactylus*.

The *Ædematophori* are a very interesting addition to our known plumes. Four species are here described, *Æ. griseus*, Wlsm., *Æ. gypsodactylus*, Fitch. (*creti*), *Æ. guttatus*, Wlsm., and *Æ. occidentalis*, Wlsm., and to these Professor Zeller adds a fifth, *Æ. inquinatus*, Zell., from Texas. Owing to the kindness of Lord Walsingham* two fine specimens of *Æ. griseus* are now in my cabinet, and before me at the present time, but they seem to me so very closely allied to the European *Æ. Rogenhoferi* from the Tyrol, that I confess myself unable to separate them, it would seem that *gypsodactylus* is also very similar to this but paler in hue and smaller; *guttatus* and *occidentalis* are very different, both of much the same type as our native *lithodactylus*, but the former "whitish-cinereous dusted with small black scales towards the costa and on the dorsal surface, and with a conspicuous whitish spot at the base of the fissure;" the other, *occidentalis*, a rather larger species, having two varieties, one pale whitish-ochreous and the other paler. This is a very handsome insect, with the markings less distinct than in *lithodactylus*, yet the following extract from the description shows how close an ally it is to that species: "Fore-wings whitish-ochreous (more yellow than in *lithodactylus*), the costa and apex slightly shaded and the dorsal margin delicately tinged with pale fawn-colour, a dark fawn coloured spot before the base of the fissure *is more or less connected obliquely with an elongated spot of the same colour on the costa beyond it.* The cilia are delicately tinged with very pale fawn-colour." The larva of this species was found on the leaves of a "sun-flower," so that like its English congener it feeds on the Compositæ. *Æ. inquinatus*, of Zeller, seems

* I take this opportunity of thanking Lord Walsingham for his great kindness in giving me specimens of most of the plumes here mentioned.

more allied to *Rogenhoferi* in colour, since the fore-wings are "of a dirty grey, plentifully sprinkled with white and brown scales so as to form here and there spots or streaks." *Pterophorus monodactylus* is distributed in America as in Europe; according to Staudinger, it extends into Armenia; it is, therefore, one of those species whose range in the Northern hemisphere is very wide indeed. The chief interest attached to it here is that our author records the two well-known European varieties, the one fawn-brown, the other with the fore-wings of a pale grey, sprinkled with darker spots and streaks.

The *Lioptili* are well represented, ten species being here described, of which six are new to science, one, *L. paleaceus*, having been before described by Zeller, one, *L. sulphureus*, by Packard, and two others, *agraphodactylus* and *homodactylus*, by Walker: the type-specimens in the British Museum enable these last two to be identified. In a genus where all the species are so closely allied it is useless to make any enumeration, the most notable, as far as beauty of colouring is concerned, are *L. sulphureus* and *L. helianthi*, the former a large species much bigger than our *L. osteodactylus*, expanding 25 mills. and having the fore-wings a bright sulphur-yellow; the latter, *L. helianthi*, resembling somewhat a very large and brightly coloured specimen of *Lienigianus*. *L. homodactylus* is whiter than any European form, but the most remarkable of the group is a new species, *Lioptilus parvus*. The palpi in this are described as "long, well clothed, sharply pointed, and twice the length of the head," this is certainly very different from the usual palpi of *Lioptilus*, which we may define as "shorter or slightly longer than the head, delicate, pointed, almost cylindrical, with the third joint sometimes drooping." Our author has, however, acted wisely in not creating a new genus for his single specimen, but in merely indicating the divergence; it is a small species with the fore-wings "dusty grey sprinkled with fuscous scales."

In the genus *Aciptilus* there is a great falling off in the number of species, as compared with those of Europe, and in these there is an evident tendency to an aberration from the type-form. Three species are given, all of which are now before me: two of these seem undoubted *Aciptili*, the first, *A. cinerascens*, Wlsm., is very similar to *L. Lienigianus* in colour and size, the other, *A. montanus*, Wlsm., is about the size of *A. paludum*, but is white with brown scales, and a costal streak of the same colour; the third, *A. californicus* is a most remarkable insect, with the wings of an *Aciptilus* but the colouring of an *Oxyptilus*, and with the same "tuft of projecting scales in the fringes of the third lobe of the hind-wings." Our author says, "its

nearest European ally is *A. siceliota*, Zell." The three *Aciptili*—*A. paludum*, *A. siceliota*, and *A. baptodactylus*, have very much in common with each other, so that they at least form a very distinct section of *Aciptilus*, and certainly there is much resemblance to this species in the group, but none of them have the tuft of projecting scales. Although the inferior lobe of the fore-wing in *Oxyptilus* is truncate, with a concave margin, yet this is not equally shown in all species, it reaches its greatest development in *O. didactylus* and *O. cricetorum*, also in the *O. ningoris* of the present work, but it is much less marked in *O. Kollari*, and still less so in the *O. rutilans* of St. Helena; none of them have, however, the simple pointed feather of an *Aciptilus*, such as is found in *A. californicus*. It is an undoubted link between *Oxyptilus* and *Aciptilus*, and very possibly may hereafter modify the classification of the plume moths.

The last of the *Pterophoridae* recorded is *Trichoptilus pygmæus*, Wlsm., a species near to the last, yet so aberrant, that a new genus had to be formed for its reception; saving in the tuft of scales on the third feather of the hind-wing, its wings are the wings of an *Aciptilus*; but its palpi are longer, the third joint not drooping and not more slender than the second, "the posterior tibiæ are thickened at the base of the spurs, and ornamented above them with erect brush-like tufts of scales." It was impossible for this to be called an *Aciptilus*, and so the necessity for the new genus was undoubted; it is the least of all the plumes yet known, and expands only ten millimètres; its anterior wings are "pale fawn-colour, dusted with fuscous-brown scales along the costa." These last two are without doubt the most interesting of the plumes discovered.

Prof. Zeller records a most remarkable genus of plumeless *Pterophoridae* from Texas; it does, indeed, as its name states, "laugh at laws." It seems the very *Archæopteryx* of the plumes, with entire wings, no naked unfeathered space as in *Agdistes* to mark where the fissure should be, and with distinct ocelli; *the hind femora being shorter than the tibiæ, seem almost the only feature which makes it a plume and not a *Pyralis*; two species are described, *Scoptonoma integra* and *S. interrupta*.

In this paper, as far as possible, species have been dealt with rather than genera, and all reference to classification has been strictly avoided; this subject has not, however, been out of my thoughts, and it is my hope to return to it at no very distant date.

* "Dass die Gattung nicht etwa zu den Pyraliden gehört, beweisen die Hinterschienen, welche über doppelt so lang, wie die Schenkel sind."

Amongst the *Alucitina* our own common *Alucita hexadactyla* (Linn.) is the sole species recorded as found in Oregon. It is the only unsatisfactory figure in the book, the plates of which are with this exception uniformly excellent.* The letter-press is also good, and the work is "got up" in a style every way satisfactory.

In conclusion, the following table of European and North American plume-moths (*Pterophoridae* proper) is appended, the British species being in italics:—

<i>Palearctic Region.</i>	<i>Neartic Region.</i>	<i>Palearctic Region.</i>	<i>Neartic Region.</i>
AGDISTIS	SCOPTONOMA	OXYPTILUS	
frankeniae	integra	maculatus	
meridionalis	interrupta	ericetorum	
Heydenii		didactylus	
manicata		Hoffmannseggii	
adactyla		obscurus	
tamaricis		marginellus	
var. paralia		Bohemani	
<i>Bennetii</i>		MIMÆSEOPTILUS	MIMÆSEOPTILUS
CNEMIDOPHORUS		Ehrenbergianus	exclamationis
rhododactylus		agrorum	semicostatus
cinnamomeus		rhypodactylus	pumilio
PLATYPTILIA	PLATYPTILIA	<i>phaeodactylus</i>	
capnodactyla	Bischoffii?	miantodactylus	
<i>ochrodactyla</i>	cervina?	pelidnodactylus	
<i>Bertrami</i>	Bertrami	<i>serotinus</i>	
<i>isodactyla</i>	adusta	var. <i>aridus</i>	
<i>gonodactyla</i>	grandis	<i>zophodactylus</i>	
farfarella	cardui	islandicus	
<i>Zetterstedti</i>	percnodactyla	coprodactylus	
nemoralis	albida	Nolckeni	
saracenica	orthocarp	<i>plagiodactylus</i>	
tesseradactyla	albidorsella	lutescens	
Metzneri	shastæ	graphodactylus	
	fragilis	<i>pterodactylus</i>	
	albiciliata	paludicola	
	modesta	stigmatodactylus	
	petrodactyla	Mannii	
AMBLYPTILIA	AMBLYPTILIA	CEDEMATOPHORUS	CEDEMATOPHORUS
acanthodactyla	pica	<i>lithodactylus</i>	gratiosus
<i>cosmodactyla</i>	cosmodactyla	Constanti	cineraceus
OXYPTILUS	OXYPTILUS	giganteus	Baroni
Kollari	periscelidactylus	Rogenhoferi	guttatus
tristis	delawaricus		occidentalis
<i>distans</i>	nigrociliatus		inquinatus
lætus	tenuis (dactylus)?		ambrosiæ
<i>pilosellæ</i>	ningoris		gypsodactylus (creti)
hieracii			grisescens
<i>teucris</i>			lugubris

* Our English works on *Lepidoptera*, of which this can be said, are few indeed; it would be well if our authors would remember that a good description is ever useful, a bad plate is only a delusion and a snare. Why cannot we have a work on *Palearctic Lepidoptera* like Dresser's birds?

<i>Palearctic Region.</i>	<i>Nearctic Region.</i>	<i>Palearctic Region.</i>	<i>Nearctic Region.</i>
PTEROPHORUS	PTEROPHORUS	ACIPTILIA	
<i>monodactylus</i>	<i>monodactylus</i>	<i>volgensis</i>	
LEIOPTILUS	LEIOPTILUS	<i>subalternans</i>	
<i>scarodactylus</i>	<i>Mathewianus</i>	<i>xanthodactyla</i>	
<i>Lienigianus</i>	<i>sericeus (dactylus)</i>	<i>xerodactyla</i>	
<i>tephradactylus</i>	<i>paleaceus</i>	<i>decipiens</i>	
<i>distinctus</i>	<i>stramineus</i>	<i>icterodactyla</i>	
<i>inulæ</i>	<i>angustus</i>	<i>taphiodactyla</i>	
<i>chryocomæ</i>	<i>inconditus</i>	<i>baliodactyla</i>	
<i>carphodactylus</i>	<i>agraphodactylus</i>	<i>calcaria</i>	
<i>microdactylus</i>	<i>sulphureus</i>	<i>parthica</i>	
<i>coniodactylus</i>	<i>homodactylus</i>	<i>tetradactyla</i>	
<i>pectodactylus</i>	<i>nævosus (dactylus)</i>	<i>malacodactyla</i>	
<i>osteodactylus</i>	<i>subochraceus</i>	<i>chordodactyla</i>	
<i>brachydactylus</i>	<i>helianthi</i>	<i>ischnodactyla</i>	
	<i>Belfragei</i>	<i>desertorum</i>	
	<i>grandis</i>	<i>olbiadactyla</i>	
	<i>Kallicotti</i>	<i>nephelodactyla</i>	
	? <i>parvus</i>	<i>pentadactyla</i>	
ACIPTILIA	ACIPTILIA	<i>paludum</i>	
<i>semiodactyla</i>	<i>cinerascens</i>	<i>siceliota</i>	
<i>galactodactyla</i>	<i>montana</i>	<i>var. ononidis</i>	
<i>spilodactyla</i>	<i>lobatus (lobidactylus)</i>	<i>baptodactyla</i>	
<i>phlomidis</i>	? <i>californica</i>		
<i>confusa</i>			TRICHOPTILUS
<i>caspia</i>			<i>pygmæus</i>
			<i>ochrodactylus*</i>

A few words of explanation must be given as to the changes in this list of British plumes since that published in 1869.

The *Oxyptilus* caught near Thetford† and in other parts of our Eastern counties is changed from *lætus* to *distans*. There is no doubt about this. Prof. Zeller first pointed out the mistake to me several years ago: *lætus* is a smaller insect, and, indeed, very different.

Oxyptilus pilosellæ is the "Mickleham plume;" no native specimen of *O. hieracii* has ever come under my notice.

Mr. Barrett, it seems to me, satisfactorily proved *Mimæscoptilus aridus* to be only a variety of *M. serotinus*. *M. Hodgkinsoni*, it is sadly to be feared, is only a form of *zophodactylus*.

M. plagiodyctylus deserves investigation, the small bright-looking form of the Lake district (*scabiosæ*, Gregson) is at first sight very different from the German specimens, which have a much larger blotch on the costa, but the "plagium" is distinct in both.

Unfortunately, no new *Pterophorus* has been added to the list.

105, Harborne Road, Edgbaston, Birmingham :

July 6th, 1881.

* I am afraid that the names *Leioptilus grandis*, Fitch, *Ædematophorus cineraceus*, Fitch, and *Trichoptilus ochrodactylus*, Fitch, must be changed, since we have *Platyptilia ochrodactyla*, *Plat. grandis*, and *Aciptilia cinerascens*; in making out this list I am much indebted to the kindness of Lord Walsingham.

† *Oxyptilus distans* was first taken in England, near Thetford, by Lord Walsingham.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(continued from page 104.)

7. HYDROTÆA, Desv.

Onodontha, pt., Rond.

Gen. ch.—Eyes either hairy or bare, contiguous or sub-contiguous in males; arista pubescent; alulets well developed, with unequal scales; abdomen mostly oval; wings with anal vein not prolonged to the margin, and with third and fourth longitudinal veins mostly curved slightly towards each other at their apices; legs with anterior femora of males always toothed at their extremities, and fore tibiæ attenuated or notched at their bases.

Sect. 1—*Eyes hairy.*

- | | |
|---------------------------------|---------------------------|
| 1. CILIATA, Fab. | 3. CYRTONEURINA, Zett. |
| <i>spinipes</i> , Fall. & Zett. | <i>silvicola</i> , Loew. |
| 2. OCCULTA, Meig. | 4. IRRITANS, Fall. |
| | <i>dentimana</i> ?, Meig. |
| | <i>meteorica</i> , Macq. |

Sect. 2—*Eyes bare.*

- | | |
|----------------------------|--------------------------------|
| 5. DENTIPES, Fab. | 9. ARMIPES, Fab. |
| 6. PALÆSTRICA, Meig. | <i>floccosa</i> , Macq. |
| 7. RONDANII, <i>sp. n.</i> | 10. FASCICULATA, <i>sp. n.</i> |
| 8. METEORICA, Lin. | <i>armipes</i> ?, Macq. |

Rondani separated the species of this genus which have hairy eyes from the others, and placed them in a separate genus, which he named *Onodontha*; and I formerly adopted his arrangement, but there are no other characters by which the separation can be supported, and in the most common species of this group, viz., *H. irritans*, which Rondani retained in the old genus, the eyes of the males are always more or less pubescent or short haired, so it is far better to keep them all together. The species are not numerous, and are united by strong natural characters, the fore legs of the males being always toothed, and the middle and hind ones often furnished with peculiar spines or tufts of hair.

H. CYRTONEURINA, Zett.

This species bears a strong general resemblance to *H. dentipes* and its congeners, having the third and fourth longitudinal veins of the wings convergent (whence its name); but it may at once be distinguished from *H. dentipes* by the eyes being distinctly haired. It appears to be a rare British species, as I have only seen one which was sent to me by C. W. Dale, Esq., of Glanvilles Wootton, Dorset, for inspection.

H. IRRITANS, Fall.

This common species abounds everywhere in England; the females swarming in woody places, especially in warm damp weather, when they cause much annoyance both to horses and men. Macquart confounded this species with the *M. meteorica* of Linnæus, which is a very different and much less common species, at least in Britain. *H. irritans* may be distinguished from all the other species in this genus by having the arista sub-plumose (not merely tomentose); the middle metatarsi of the males pectinated beneath with thick-set strong bristles; and the posterior tibiæ (which, as well as the posterior femora, are somewhat elongated and curved) ciliated at the apices with a small tuft of soft hairs.

H. DENTIPES, Fab.

This species, like the last, is exceedingly common; it is distinguished, together with the two following species (to both of which it is closely allied), from the others

Fig. 2.



in this section by having the extremities of the third and fourth longitudinal veins of the wings strongly convergent (Fig. 2). The males of *H. dentipes* may also be known from the others by the posterior tibiæ being somewhat curved, and furnished at their apices on the inner sides with a callosity or tubercle covered with short adpressed hairs; the anterior tibiæ also are ciliated with a small tuft of hairs on their under-surfaces toward their fore part; the middle tibiæ are armed along their whole external surfaces with a number of very minute erect bristles of even lengths, arranged irregularly in several rows, giving a peculiar appearance under a powerful lens, as if the side of the limb was covered with a "chevaux de frise;" and lastly, the abdomen is tessellated with white reflections.

H. PALESTRICA, Meig.

This species, often confounded with the former, is rare, and has never been characteristically described. It bears a great general resemblance to *H. dentipes*, from which it differs in the following points: the posterior tibiæ are less curved, and have no callosity at the apex; the anterior tibiæ are without the tufts of hair on their under-surfaces; the middle tibiæ are ciliated along their outer sides with short curved hairs, which are not erect, but incumbent or imbricated over each other; and the abdomen is of an uniform grey colour, with a narrow dorsal stripe.

H. METEORICA, Lin.

This little species, though abundant on the continent, is not of very common occurrence in England. The males are black, usually with fuliginous wings; have black halteres, and two rather long sharp teeth at the ends of the anterior femora.

H. ARMIPES, Fab.

Two species have been mixed together under this name, but the true *armipes* may be distinguished from its congener, which I have named *H. fasciculata*, by the following characters: the anterior femora have two teeth on their under-surfaces, one much larger than the other, the smaller of which has been overlooked by most authors, with the exception of Macquart, who mentions it in his description of *H. floccosa*; there is a single long, straight, blunt spine (or rather bristle) in the middle

of the under-surfaces of the posterior femora, and the lower half of the inner surface of each posterior tibia is ciliated with longish soft hairs extending to the apex, which commence by a tuft or loose pencil of hairs much longer than the others in the middle of the limbs. This is a common species.

H. RONDANII, *sp. n.*

Mas., niger nitidus, abdomine oblongo-ovato fusco-cinereo non tessellato; linea longitudinali lata nigra; oculi nudi sub-remoti; alæ sub-fuscæ, renis longitudinalibus 3^{to} et 4^{to} versus apices paulo inflexis; femora antica bidentata.

Long. 3½ lin.

Head: eyes bare and separated by a wide black stripe, which occupies about one-seventh of the width of the head; arista pubescent at the base, which is thickened.

Thorax with *Scutellum* black, shining, and unstriped.

Abdomen of a brownish-grey colour, without white reflections, and having a widish black longitudinal stripe down the middle of the dorsum, of an even width over each segment, though slightly evanescent on the last; genital appendages forming a small cylindrical projection underneath.

Wings short, of an uniform yellowish-brown colour; internal transverse veins exactly opposite the ends of the axillary veins; external transverse veins sinuous, and slightly oblique; third and fourth longitudinal veins slightly convergent at their extremities, but less so than in *H. dentipes*.

Calyptra rather small (less than in *H. dentipes*) and yellowish-brown. *Halleres* with the stem tawny and the knob blackish-brown.

Legs black; anterior femora with two teeth on their under-sides near their apices, the inner of which is about twice as long as the outer; anterior tibiæ narrowed at the base, slightly notched (less so than in *H. dentipes*), and without peculiar spines; middle femora bearded on their under-sides at the base with a tuft of black hairs as in *H. dentipes*; middle tibiæ ciliated along the whole length of their outer sides with a series of short curved hairs or bristles of even length, imbricated over each other, and having in addition three long strong bristles on their lower halves; there are also three or four shorter bristles on the posterior sides of the same limb; posterior tibiæ attenuated at the base, and without callosities at their inner extremities, slightly curved, and ciliated along their outer surfaces with soft hairs, which become gradually longer towards the apex; there are also several long bristles on the posterior surfaces at the lower ends.

The female is unknown to me.

This species bears a very close resemblance to *H. palæstrica*, but differs in being smaller and darker in colour, in having shorter and browner wings; a rather wider frontal space between the eyes; and a much wider longitudinal dorsal stripe on the abdomen. It appears to be rare, as I have only seen one specimen, which I captured near Bicester, Oxon, in June, 1880.

H. FASCICULATA, *sp. n.*

Mas., niger nitidus pilosus; abdomine ovato albo cinereo, linea longitudinali nigra, segmento secundo dilatata signato; oculi coherentes nudi; femora antica unidentata; femora postica subtus setis duabus contiguïs medio instructa; tibiæ posticæ tibiis tribus longis forma penicilli rigidi ornata.

Long. 2 lin.

Head : eyes contiguous, naked ; arista almost bare ; face silvery-white, very slightly prominent.

Thorax shining black, unstriped, having four bristles behind the suture in each medio-lateral row ; sides setose. *Scutellum* black.

Abdomen ash-grey, ciliated with long soft hairs on both edges and middle of segments ; first segment black at the base, from which extends a longitudinal black stripe down the dorsum, which is dilated into a triangular black spot on the second segment, the apex of the triangle being backwards, and ending in a narrow line passing over the third and fourth segments ; anal appendages small and shining black.

Wings hyaline ; transverse veins rather near together ; external one slightly oblique, and a little sinuous ; third and fourth longitudinal veins running almost parallel to each other towards the apex.

Calyptra yellowish-white. *Halteres* dingy yellow.

Legs black ; anterior femora with a single sharpish tooth on the under-surface near the end ; anterior tibiæ narrowed at the base, and with the lower two-thirds thickened and shortly ciliated on posterior surfaces ; middle femora armed on under-surfaces near the base with two or three strong blunt bristles ; middle tibiæ furnished along the whole of their external surfaces with numerous minute erect spines, somewhat similar to those found in *H. dentipes* ; posterior femora with two straight blunt hairs, placed near to each other, on the under-surface, exactly in the middle ; posterior tibiæ with a small rigid peneil of about three long hairs, converging to a point on their anterior surfaces a little before the middle ; a few short soft hairs are placed on both inner and outer surfaces near the apex.

I do not know the female.

This species bears a very close general resemblance to *H. armipes*, with which it has evidently been confounded. Zetterstedt says in his description of the latter, "variat ♂ femoribus posticis subtus in medio setulæ geminæ." Besides the points of distinction which I have mentioned between these two species, I may add that the poisers are fuscous in *H. armipes*, and yellow in *H. fasciculata* ; the wings are slightly brown in *H. armipes*, and almost white in *H. fasciculata* ; and lastly, the anterior tibiæ are slightly bearded with some long hairs on their under-surfaces in *H. armipes*, while they are only ciliated with short hairs in *H. fasciculata*.

This little fly is generally distributed.

(To be continued).

NOTES ON TENTHREDINIDÆ.

BY J. E. FLETCHER.

The ♂ of *Hemichroa alni* has hitherto been reputed very rare. My experience of the species is very limited, as I have bred only nineteen specimens, four in August, 1880, and fifteen in May last but of these, two of the former, and eight of the latter were ♂—thus outnumbering the ♀ by one.

Until this year *Hemichroa rufa* was supposed to have no ♂, but out of some ninety specimens of the species that I bred in May, two proved to be ♂. As, doubtless, Mr. Cameron will describe this sex in his forthcoming work on these insects, I refrain from doing so.

On July 19th, 1880, I found a *Fenusa* larva mining a blotch in a leaf of *Populus nigra*. In a day or two it went to earth, and the imago was bred on June 1st of this year, the insect having been more than ten months under the soil. It proved to be *Fenusa hortulana*, Kl. As it differed slightly from the published descriptions, I submitted it to Mr. Cameron, who kindly examined it, and confirmed my identification thereof. In July last I found another larva on the same tree, at Crown East, and three others at Broadheath and Hallow.

In the first third of this month (September) I succeeded in collecting twenty larvæ of *Phyllotoma ochropoda*, a number only once before equalled in one year. It seems not to occur in every place where its food-plant (*Populus tremula*) is common; but I have found it at Monk Wood, Trench Wood, and Crown East Wood.

My local list of *Tenthredinidæ* now numbers 130 species, in the investigation of which I have experienced many delightful hours.

To Mr. Cameron my thanks are due for all, as until he determined my captures and assisted me with types, I knew by name not more than six species.

Worcester: September, 1881.

ON PARTHENOGENESIS IN *TENTHREDINIDÆ*.

BY J. E. FLETCHER.

Having continued my experiments in this subject during the current year with virgin ♀ saw-flies, I offer the following notes:—

Hemichroa rufa.—The dozen larvæ of this species mentioned (Ent. Mo. Mag., xvii, 180) as having spun up, attained the perfect state in May last, all ♀. Notwithstanding this, the species is not entirely without ♂, as will be seen in another place.

Cræsus varus.—Two ♀ were bred in May, and deposited eggs from which larvæ hatched, but only two reached the imago state—both ♀.

Nematus salicis.—From a specimen bred in May I obtained five larvæ, three of which spun up, and yielded ♂ imagines.

The following were tried, but none of them produced ova:—*Trichiosoma vitellinæ*, *Dineura Degeeri*, *Nematus croceus* (2), *Hemichroa rufa* (2), and two of the parthenogenetic brood of the latter above mentioned.

Worcester: September, 1881.

FURTHER NOTES ON PARTHENOGENESIS IN *COLEOPTERA*.

BY J. A. OSBORNE, M.D.

I send you by this day's post a parthenogenetically-bred *Gastrophysa raphani*. It is the second I have succeeded in rearing. Of the first there is some account in this Magazine, vol. xvii, pp. 127—130; it died after a life of 35 days, and developed "gastrophysm," and on examination it proved to be a female. The present example has the peculiarity of one of the elytra being "cut away" so that they gape, and it has a further defect in the anterior tarsi, which caused embarrassment and awkwardness when it was alive. This is likewise a female, and although it lived but 17 days, it developed a large amount of "gastrophysm," and paired with two different males; no eggs, however, were laid by it. The egg that produced it was one of a batch of 42; of which 18 showed signs of vitality, but only two produced larvæ. It was laid by a virgin female on the 14th June, and hatched on the 24th. The first and second moults occurred on July 1st and 5th—6th respectively. The metamorphosis to pupa took place on July 14th—15th, and the imago appeared on July 23rd. The batch of eggs was the fourth laid by the same mother; all the batches, of which twelve were laid before impregnation, showed an extraordinary amount of parthenogenetic fertility. Of 146 parthenogenetic eggs, six hatched, and the larvæ lived a shorter or longer time. After this the insect was allowed to pair with a male, and the subsequent eggs became perfectly viable.

Nothing has struck me more in these experiments than the perfectly graduated scale of degree of fertility and developmental capacity in both impregnated and unimpregnated females, and the eggs laid by them. The two series overlap to a considerable extent, and are so continuous as to represent virtually one series, in which the male influence may be regarded as only a collateral (though, of course, extremely important) circumstance. The indications of being "addled," which occur in two or three days, are just as characteristic of eggs laid by impregnated beetles that have escaped fertilization, as in parthenogenetic eggs. But the great majority of even virgin eggs pass beyond this condition, and at the usual time for hatching are uniformly yellow and of gelatinous consistence, and in these, more minute examination often reveals all degrees of imperfect development. Few, however, hatch, and the larvæ usually die very soon. Development in these is not only imperfect, but is also retarded.

I consider that the parthenogenesis in *Gastrophysa raphani* is not at all a rare and accidental circumstance, but may be looked for with

almost as much certainty of finding it as in *Nematus ventricosus*; at any rate, in the spring and early summer months. I have not yet met with *G. polygoni*, but would be glad to obtain eggs of it at the proper season.

Finally, I must call attention to the seeming *purposelessness* of so much parthenogenetic fertility in *G. raphani*. The sexes always appear to be present in about equal numbers, and one male is able to fertilize many females. It would appear to be without any place in the economy of the insect analogous to that of bees and wasps, according to the theory of Dzierzon and Von Siebold. It appears to me rather the concomitant of a prevalent species supplied with abundant food of a stimulating quality.

Milford, Letterkenny, Ireland:

October, 1881.

NATURAL HISTORY OF *CRAMBUS WARRINGTONELLUS*.

BY WILLIAM BUCKLER.

Of this species I last year received two batches of eggs, the first on the 14th of August from Mr. W. H. B. Fletcher, and obtained by him in the New Forest, and supplemented afterwards with a few more, and the second batch six days later from Mr. J. Gardner, of Hartlepool, and to both friends I return many thanks.

All the eggs were laid loose; those from the South hatched on 16th of the month, and up to the 1st of September; those from the North began to hatch on August 27th, and had finished on the 29th. The young larvæ from these wide apart localities were kept separate, and placed in pots with growing plants of *Festuca duriuscula*, *Aira flexuosa*, and some other grasses of a hard nature; their progress was noted up to the middle of November, when they began to close their numerous galleries for hibernation, after having very considerably ravaged the grass.

In early spring of 1881, I noticed a great number of them busily engaged in afternoons, whenever the sun shone on the pots, spinning threads in all directions round the outside of the grasses which had in the interval recovered in a great degree; but for some time after this I was unable to attend to them, until at length I observed the grass to be nearly all dead; then, when almost too late I had the mortification to find the greater part of them had deserted their quarters, though enough still remained to serve my purpose of figuring the larvæ and breeding the perfect insects.

The moths from the New Forest were bred on July 7th to 17th, and those from Hartlepool on July 13th to 17th; and here it may be stated there was no very appreciable difference in the moths from either locality, beyond this, that the darkest southern example was of a satiny creamy-yellowish ground-colour, with the veins and inner margin dark bronzy-green; the darkest from the north was of a whitish cream-colour and bronzy-brown; while on the other hand the lighter examples of the south had the veins and inner margin browner, while the northern were more green.

The shape of the egg is broadly elliptical, appearing almost truncated at the ends, the shell numerously ribbed and finely reticulated; the colour when first laid is pale straw, changing gradually in a day or two to pinkish-red, which deepens until about the tenth or eleventh day when it is brownish-red with a greyish-brown spot at one end, and then hatches in a few hours.

The young larva is of a light salmon-red colour showing an internal deeper reddish vessel through the skin, the head and neck plate darkish brown, and a paler brown anal plate: by the middle of November the case or gallery it has constructed is a quarter of an inch long, composed outwardly of finely comminuted grassy particles firmly attached to the grass about three-quarters of an inch above ground; the larva itself at that time, while yet feeding during mild days, is nearly three-sixteenths of an inch long, and comes out readily from its abode when disturbed, it is of stoutish character, tapering a little posteriorly, the skin slightly glistening and of a lightish mahogany-brown colour, the usual spots glossy dark transparent brown with a black dot in each—the plates and head also dark transparent brown—the lobes of the head very dark, also the mouth, ocelli black.

After hibernation some are full-fed and spun-up by the end of May, while others are not yet full-grown, ranging in length from half an inch to five-eighths, and go on feeding till the second week in June; when near full growth they inhabit tubular galleries two inches long of irregular figure, and firmly attached to the grass in an upright position with the lower end touching the ground, and fabricated of grey silk covered with particles of moss, frass, and grains of earth.

When full-grown the larva is three-quarters of an inch long, of moderate stoutness, cylindrical, though tapering a little at the three hinder segments, and the head is rather smaller than the second, the segments are well defined and have a sub-dividing wrinkle about in the middle of each: the ground-colour of the body is a dirty greyish-green rather inclining to glaucous and a little paler on the belly, the

skin though dull is yet clear enough to show a darker dorsal pulsating line, the shining head, and plate with a wide behind dorsal division are of lightish warm brown, both dotted and marked with darker brown, mouth blackish, the shining spots on the back and sides, each bearing a hair, are of a darkish warm brown on the back, lighter brown on the sides, the small round spiracles are black, the anterior legs ringed and tipped with darkish brown, the ventral legs fringed with dark brown hooks: when full-fed and about to spin up, the colour of the skin changes to a pale pinkish-brown.

The pupa is enclosed in an oval cocoon half an inch long and quarter of an inch wide, made with similar materials to those of the gallery, but is more tough and stronger and sunk partly in the earth; the pupa itself is three-eighths of an inch long with no peculiarity of shape, with longish wing covers, leg-and-antenna-cases, the tapering abdomen ending in a short truncated projection, the spiracles rather prominent; the colour at first is pale yellowish-brown and shining, changing to dark brown a little before the insect is disclosed.

Emsworth: *September 30th*, 1881.

LIFE HISTORY OF *DEILEPHILA SPINIFASCIA*, BUTLER.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

The larvæ of this fine species were abundant in the neighbourhood of Valparaiso at the end of 1872 and beginning of 1873, and as they were of all sizes, and ova were to be found throughout October, November, December, and January, the probability is that there is a succession of broods throughout the year. Their food-plant, *Muhlenbeckia injucunda*, called by the Chilians the "Quilo," grows in profusion all over the country, and in some places inland becomes a large straggling plant of vigorous growth, often entwining itself among other shrubs and attaining a considerable height, but immediately on the coast-line it never grows to any great size. The parent moths usually select small stunted scrubby bushes, growing in exposed places, whereon to deposit their eggs. The eggs hatched in the course of a week or ten days. The young larvæ were exceedingly beautiful creatures, but after their last change they were by no means so handsome, and, moreover, at that age varied very considerably. Before undergoing their last moult they were as difficult to sketch or describe as the larvæ of *Deilephila euphorbiæ*, but the following description will give a pretty fair idea of what they were then like. Ground-colour deep velvety-black; on fifth to eleventh segments inclusive there is a pale yellow ocellated spot, having a pink centre, and this

spot is enclosed by an intensely black perpendicular stripe which runs from the dorsal to the spiracular line; behind this, on each segment, there are five alternate golden-green and black perpendicular stripes, the first being three times the width of the other four; dorsal stripe rather broad and pale pinkish-yellow; spiracular stripe as wide as the dorsal and bright red; spiracles small and yellow; under-surface dark olive-green thickly dotted with yellow spots; head, prolegs, and claspers dull red; horn dull red with a black tip; the dorsal stripe runs through the horn to the extremity of the anal claspers where it is bordered on each side with deep black.

The full grown larvæ (which are as large as those of *Sphinx ligustri*) as I have mentioned before, vary exceedingly, hardly two being alike, but the following was perhaps the most usually met with and typical form. Ground-colour olive-green; dorsal stripe broad and pink; sub-dorsal line pink enclosing from fifth to eleventh segments a bright red ocellated spot with shining black pupil; just below the spiracles, which are pink, is another interrupted stripe of the same colour; under-surface, which is somewhat wrinkled, dark olive-green thickly spotted with yellow; head, prolegs, and claspers pink; horn rough, pink with a black tip.

The following is a description of four of the varieties:—

Var. A.—Whole of the upper-surface dull black; ocellated spots pale pink with intensely shining black pupils; dorsal stripe narrow and red; an interrupted sub-dorsal stripe from the second to fifth segment, where it merges into the ocellated spot; behind each ocellated spot are two small faint pink spots indicating a continuation of the sub-dorsal stripe; skin-folds on each side of the face much wrinkled and pale yellow; spiracles pale straw-colour, and beneath them runs a broad interrupted pink stripe; under-surface blackish-green spotted with yellow; head, prolegs, and claspers dull red; on the twelfth segment there is an oblique pinkish stripe; above the anal claspers there are two oval pink spots; horn dull red with black tip. This was a common variety.

Var. B.—Whole surface pale olive-pink; ocellated spots straw-colour, with black pupils, and bordered outside with black; head pale olive-green; dorsal stripe broad and pale pink; sub-dorsal line of the same colour, but so faint as to be scarcely perceptible; spiracles orange in a black ring; spiracular line very faint and pink; prolegs and claspers bright pink; horn pale blue.

Var. C.—Ground-colour olive-brown; dorsal stripe very broad and of a clear straw-colour; sub-dorsal line pink and much interrupted; ocellated spots with intensely black pupils, bordered by a narrow ring

of pink and that again by a broad ring of black; below the spiracles, which are deep orange, a broad pale pinkish-yellow stripe, bordered above by numerous yellow square-shaped spots; under-surface lead-colour thickly spotted with yellow; head pinkish-brown with pink cheeks; prolegs and claspers pink; horn lead-colour with black tip.

Var. D.—Entire surface bright pea-green; ocellated spots with black pupils, bordered by pink and black; dorsal and spiracular stripes bright pink; spiracles orange; under-surface a slightly darker shade of green and thickly dotted with small black spots; head, prolegs, and claspers bright pink; horn pink with black tip. This was a very beautiful variety but it was very rare.

This species seemed to be confined entirely to the coast line, but even here it was local, though, where it occurred, it was usually very plentiful. I have counted as many as twenty-one larvæ of different sizes on a single small bush. The young larvæ feed quite exposed, and on account of their brilliant colour were very easily seen, but the full-grown ones, although sometimes to be found on their food-plant, were oftener to be seen on the bare ground by the side of it, and they did not exhibit any desire to hide themselves beneath the branches. They appeared to be exempt from the attacks of birds, for notwithstanding there were numerous insect-loving species constantly feeding around them, I never saw one touch them. However, they had one dire enemy which preyed on them and kept down their numbers, and this was a horrible long-legged black spider with an immense bloated abdomen, decorated on each side with a bright scarlet spot. These creatures, which were said to be poisonous, dwelt in holes at the root of the "Quilo," and when hungry issued forth and seized a larva, although they did not seem to be able to manage a full-grown one. Besides the remains of larvæ I noticed dozens of dead and dried up beetles in their retreats, showing that they occasionally varied their diet.

When full-fed the larvæ collect dead leaves, &c., around them, and spin a loose sort of cocoon on the surface of the ground, in which they change to a reddish-brown pupa resembling that of *C. Elpenor*. Sometimes I found the pupæ lying quite exposed, in no cocoon whatever, beneath the bushes, and at other times I came across them in little holes under stones when I was looking for *Coleoptera*. One day I found a pupa which was rather larger and more slender than those of *spinifascia*, and in a short time it produced a fine *Deilephila Annei*, Guér., being the only example of this species that I obtained.

Instow, North Devon :
May, 1881.

DESCRIPTION OF AN *EUDOREA* NEW TO SCIENCE (*EUDOREA CONSPICUALIS*).

BY J. B. HODGKINSON.

Expanse of wings (♂) 8 to (♀) 9 lines. Palpi light above, dark beneath. Tongue yellow (a conspicuous object). Eyes large, dark. Head silvery-grey. Antennæ steel-grey, short. Thorax and abdomen silvery-grey.

Fore-wings with the basal area silvery-grey (under a low power very quaintly irrorated), with two dark lines proceeding from the base, of which the lower line is the longer; first line slightly curved; the orbicular stigma oval, filled in with very pale ochreous, the claviform stigma often linear or arched and attached to the first line, often running well into it on the fold; central area dark grey, irrorated, having a well pronounced dark blotch on the costa above the reniform stigma; this stigma varies in form, often it is K- or B-shaped (rarely forming the figure 8), the B wanting part of the top and bottom looks like the figures 13; the second line commences with a rich dark grey patch below the costa pointing outwards, then inclines inwards a little below the sub-costal nervure; the posterior area is bright light silvery-grey, having very light faint irrorate patches, dark near the margin, which has two rows of well-defined streaks (not dots) at the inner edge of the cilia; cilia light, long. Hind-wings light silvery-grey.

The general appearance is light silvery-grey, the form rather broad; intermediate between *E. pyralella*, H., *ingratella*, Zeller, and *atomalis*, Doubleday, it sits triangularly and may be known, when at rest, from any other *Eudorea* by the distinct pale basal area standing out as a whitish dot on the tree-trunk, on which the insect rests. It appears in July and August near Windermere. I first met with it 10 years ago, when in company with Mr. C. S. Gregson; I have since revisited the district and taken a nice series. When on the wing it appears as pale as *E. pallida*.

Spring Bank, Preston:

September 18th, 1881.

DESCRIPTION OF A NEW BUTTERFLY FROM THE MALAY PENINSULA.

BY W. L. DISTANT, V.P.E.S.

CETHOSIA LOGANI, *n. sp.*

♂. Above: anterior wings with the basal third bright red, remainder black with white markings. Three pairs of narrow black longitudinal fasciæ crossing cell, the last pair somewhat indistinct owing to proximity of the black area, an indistinct arcuated spot beneath cell, and two somewhat waved linear spots, situated one beneath second median nervule near its base, and the other beneath the third median nervule about one-third from its origin. The dark area contains the following white markings: four spots a little beyond end of cell, of which the third is very small, the others linear and transverse, beyond these are two rows of small rounded

spots situated wide apart, a very large sub-quadrate spot commencing at first and terminating near third median nervule, followed by a small sub-lunate spot, and a sub-marginal row of large but somewhat obscure lunate spots. Posterior wings bright red with the outer margin broadly black, inwardly bordered with a series of irregular spots of the same colour, and nine or ten black spots near base; the broad black marginal border contains two small red spots divided by the discoidal nervule, and a marginal series of large pale and obscure lunate spots.

Under-side of wings in general pattern as in *C. nicobarica*, Feld., but white markings much more predominating, and differing principally by the third transverse fascia on the posterior wings, which is broader, more irregularly spotted above, and much more regularly and closely margined with small rounded spots beneath. All the fasciæ are also placed closer together than in Felder's species, and the large sub-quadrate spot on the fore-wings is also visible beneath.

Expanse of wings, 73 millim.

Hab., Province Wellesley.

This is a very distinct race or species of the Malayan representatives of the genus. It is most closely allied to *C. nicobarica*, from which it differs by its much smaller size, the extent of the white markings on the anterior wings, and the different pattern beneath, as already described, and its natural position appears to be between Felder's species and *C. Methypsea*, Butl.

C. Logani will be figured in a forthcoming work, "Rhopalocera Malayana."

Derwent Grove, East Dulwich :

October, 1881.

DESCRIPTIONS OF SOME APPARENTLY NEW SPECIES OF *ARCTIIDÆ* FROM NORTH AMERICA.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Having recently had occasion to go through the descriptions and examine the figures of all the known N. American species of *Arctia*, I have found that two or three species in the National Collection are still unnamed.

Although it is always possible, in so variable a genus as *Arctia*, that any named form may turn out to be an aberration or sport of something previously described; I still think it useful to have names for such forms (even in the event of their proving to be sports), as it obviates the necessity of describing them on every occasion when they are referred to.

The first species to which I shall have to call attention is nearly allied to *A. phyllira*, of Drury; unfortunately, it bears no locality, so that it is possible that it may be a Mexican representative of Drury's species.

ARCTIA DODGEI, *sp. n.*

The primaries differ from *A. phyllira* in being of the peculiar greenish-grey tint of *Hypercompahera*, and with the pattern of *A. Williamsii*, of Dodge; the thorax is also slightly greenish; but the secondaries and abdomen are like those of typical *A. phyllira*.
Expanse of wings, 45 mm.

The next species is allied to *A. phalerata*, but it seems to me to be quite distinct; it certainly differs more than most of the species of *Arctia* described nowadays.

ARCTIA OCHREATA, *sp. n.*

Allied to *A. phalerata*, but the cream-coloured stripes on the primaries are deeper in colour and more slender, the sub-apical oblique stripe completing the Σ -shaped character always more or less abbreviated, and sometimes absent (one example shows only the commencement of the furcation, which, when completed, produces this character); secondaries bright ochreous, instead of pinky-white, with rose-coloured abdominal border; the sub-marginal series of black spots much enlarged, the sub-apical one frequently confluent with the costal border, producing a large black apical patch, also a well-marked marginal spot between the second and third median branches; body ochreous; a broad longitudinal streak on the middle of the thorax, a stripe on the tegulæ, and a broad belt through the abdomen, black; similar differences on the under surface.
Expanse of wings, 34 to 43 mm.

United States (*E. Doubleday*).

We have four examples of this form in the Museum, two of them presented by Doubleday, the others from two distinct sources, but in no case have we received the exact habitat: "United States" having, I suppose, been considered sufficient by the old collectors.

The third and last *Arctia* to which I shall have to advert differs from *A. ochreata* much as *A. decorata*, Saund., is supposed to do from *A. Nais*, Drury.

ARCTIA RHODA, *sp. n.*

♀. Also allied to *A. phalerata*, the stripes on primaries narrower and ochreous; the sub-apical stripe sometimes abbreviated; secondaries deep rose-red, the black spots rather larger than in *A. phalerata*; abdomen also deep rose-red at the sides.
Expanse of wings, 41 mm.

United States (two examples).

I think it quite possible that this may be the female either of *A. phalerata* or *ochreata*; but, if so, what becomes of *A. decorata*, Saund., which agrees absolutely in everything but the colour of the secondaries with Drury's figure of *A. Nais*? one of the examples has an old label attached to it, with the name "*vittata*" inscribed thereon.

British Museum:

October, 1881.

ON CERTAIN BRITISH *HEMIPTERA-HOMOPTERA*.

BY JOHN SCOTT.

*(Continued from p. 105).**DELTOCEPHALUS I-ALBUM, sp. nov.*

♀. Clear pale brownish-yellow. *Crown* yellowish-white with a brownish spot on each side of the centre at the apex, a short brownish streak within the anterior margin extending to within a short distance of the anterior margin of the eyes, and a short transverse streak of the same colour in a line with the latter. *Face* bone-white. *Frons* black, with three transverse, slightly curved, white streaks, the upper two clubbed at their inner extremity, side margins narrowly black to within a short distance of the apex, divided by one or two white spots, within the lower margin two short, transverse, black spots. *Clypeus* yellowish. *Rostrum* brown, apex narrowly black. *Loræ* pale yellowish-white, inner margin narrowly black. *Cheeks* pale yellowish-white, with a small black spot on the inner margin near the apex.

Pronotum yellowish-white with a somewhat indistinct, pale, longitudinal, central line, and a reddish spot on each side of the same at the base. *Scutellum* clear pale brownish-yellow, with a short transverse channel in the centre, the space between this and the apex white. *Elytra* clear pale brownish-yellow, shining, nerves fine: *clavus*, apex of the axillary nerve white, anal nerve pale brownish-yellow, apex white, area enclosed between the latter and the suture white at the base, in which is a dark spot: *corium* clear pale brownish-yellow, transverse nerve of the basal area broadly white, the colour extending for some distance along the brachium and cubitus, and forming an I-shaped character, posteriorly narrowly bordered with brown; nerves of the ante-apical and apical areas fine, white, apex of the latter margined with black. *Legs* pale yellowish-white; *thighs*: 1st pair with a black or pitchy-black band next the base; 2nd with a pitchy-black spot on the upper margin near the apex, and another on the lower margin towards the base; 3rd yellow, with three or four minute black spots on the upper margin at the apex; *tibiæ*: 3rd pair yellow, apex narrowly black, spines brown, set in black punctures, some of which are in pairs; *tarsi*: 1st and 2nd pairs yellow, 3rd black, 1st joint at the base yellow: *claws* of all the pairs black.

Abdomen above, black; basal four segments on the sides yellow: 5th and 6th yellow, the former with a fine black longitudinal streak on the side, the latter with two black spots on each side of the posterior margin, one placed at the lower extremity, the other in a line with the streak on the former: underneath black, posterior margin of the 2nd, 3rd, and 4th segments very narrowly red, terminal two yellow, posterior margin of the last }-shaped, with a black margin and a depression on each side.

Length, $1\frac{3}{4}$ line.

This species forms one of a large group of which *D. ocellatus*, Fall., *D. oculatus*, J. Sahlb., &c., may be taken as types. It certainly does not agree with any of the descriptions of the late Dr. Fieber, nor with any of his types, either on the continent or in my collection. At the same time as the genus is so remarkable for its variability, I am not positively prepared to see the name retained which I have given to

this form. The bone-white face, the black frons, with the three transverse pale lines, the white I-shaped character across the transverse nerve of the basal area of the corium, alone afford characters for its easy recognition.

Taken by Mr. J. Edwards, near Norwich.

Lee, S.E.: 6th October, 1881.

The influence of Volcanos on flying Coleoptera.—On the 15th July, 1880, I ascended a volcano in South Yezo, and I may roughly describe the mountain as being about 2600 feet high, with vegetation of small oak and alder to 1200 feet, and then shrubs and grass, leaving a cone of 600 to 700 feet, a bare surface of powdered lava or sand to absorb and radiate the heat of a July sun.

On the oaks and alders were many *Lucanidæ* and *Elateridæ*, a *Calosoma*, and now and then a tree *Silpha* allied to *4-punctata*. In the high sandy area I saw nothing but sand-piercing *Hymenoptera*, until I reached the ridge of the crater. The ridge was about 15 to 20 feet broad, and the crater say 150 deep, and at the bottom jets of steam, bubbling sand and sulphur, made walking in some parts impossible, or even dangerous. Sitting on the ridge, tired and hot, I felt the mountain draught most refreshing, and, in a few moments more, discovered around me a number of *Elateridæ*, some dead and dry on the sand; others struggling on their backs, and now and then some new arrival on the wing, fresh and vigorous from the forest below, came to join the dead or dying on the crater's edge. Looking about, I subsequently obtained a few dead *Silpha 6-carinata*, Mots. It seemed to me that about three hours were sufficient to kill an *Elater* after it dropped on the sand, the great heat gradually destroying its life by abstracting its moisture, and I observed specimens fall on the ridge that were not carried over into the crater. The *Elateridæ* consisted of two or three tree-species with red elytra, and doubtless began life in the forest below, and were not seeking food on the burning sandy height. The conclusion is, therefore, that they were carried up involuntarily, borne on the current of wind, which was flowing upwards to the crater, and caused by the different temperature on the sand to that in the area of vegetation below it.

When I passed through the forest, insects in this northern latitude were in the profusion of summer; and the question arises—why, of all this abundance, did the *Elateridæ* and *Silphidæ* alone arrive to perish on the dry heated lava. The elytra of these species, when raised to the angle necessary to allow the membranous wings action for flight, are just in that position to catch the full force of the upward current, and thus these species with ample elytra met their death by being mechanically lifted up into the arid region of sand. No *Elaters* were found in the crater, as at the ridge the direction of the air-current changed, and they fell on the earth; and the sand-piercing *Hymenoptera* of the intermediate area were absent on the ridge, as their wings, all used for motive power, enabled them to fly hither and thither in the breeze, and they remained in their natural location.

These notes throw some light on the shortened wing-cases of certain *Coleoptera*, notably, of course, the *Brachelytra*. Then a few *Longicornia* (*Necydalis*), a few *Telephoridæ* (*Ichthyurus*), and a good many *Nitidulidæ*. The *Staphylinidæ* are very free fliers, and their wings would, with ample elytra, be powerless to direct

their movements in mid-currents. *Bledii* and *Trogophlæi* would be carried away from their burrows in the mud-flats to situations unfit for their existence, and all the minute members of this family are largely dependent for their well-being on the humidity of the situations where they dwell. Large heavy-bodied insects have a weight to counteract the undue influence of the wind, hence the *Lucanidæ* were absent on the ridge; and the *Longicornia* have a counterpoise in the long antennæ. But in the *Staphylinidæ* the advantage of shortened elytra is very marked, and is one of those forms of organization which extend the lives of individuals and races by fitting them for the mechanical contingencies of their existence.

The traveller in Japan, go in what direction he will, meets with mountains, and in going over the "toge" or passes between them, will generally ascend with the breeze, or face it as he descends, after passing the ridge, and many times in such places, by sweeping where there is vegetation, have I obtained great numbers of *Melanotus* and other *Coleoptera*, evidently collected there by the breeze.

The shortened wing-case in all the families mentioned is accompanied with a prolonged abdomen, which is an additional balancing power, and it is significant that a very large proportion of the flying *Coleoptera* belong to the *Brachelytra*, and that mountain species, such as *Lesteva*, have the longest elytra, and cling to the under-surfaces of stones near water. In Japan there is one genus, *Trygæus*, which is sluggish, living under damp leaves in forests, and its elytra are scarcely shortened at all. It would, however, be difficult to base any general theory upon these facts, as so many mountain species have very abbreviated elytra and no wings at all, and such wet-loving sluggish creatures as *Acrognatha* have short elytra utterly disproportionate to the length of their body.

In former days I frequently found *Hydaticus* (Trans. Ent. Soc., 1873, p. 45) under stones at an elevation of 1600 feet, that is, 1200 feet above any water, and this spring I secured two examples on the back-bone of the same mountain, and I now account for their presence at this altitude by their being caught by an ascending current, the membranous wings being insufficient to counteract the lifting power of the elytra.—GEORGE LEWIS, Hiogo Hotel, Kobè: July 8th, 1881.

Coleoptera near Hastings.—The following are some of our best captures this season:—*Melandrya caraboides*, a few in an ash-log at Hollington; two or three *Mordellistena abdominalis*, by beating May-blossom; *Atemeles emarginatus*, caught flying over a road at Hollington. We have again met with a few specimens of *Athous difformis*. The Camber sand-hills have produced *Crypticus quisquilius*, *Helops pallidus*, *Xantholinus tricolor*, a quantity of *Cteniopus sulphureus*, off *Galium*, and *Ceuth. echii*, which was abundant on *Echium*. From a dead cat, at the same place, we got a small series of *Saprinus immundus*. *Phaleria cadaverina* was very plentiful under putrid fish in the larval as well as the perfect state. Some moss yielded a few *Hyperaspis reppensis*; *Silpha littoralis* was not uncommon in rooks which we hung up in a wood at Guestling, in May, accompanied by a few *S. thoracica*, *Necrophorus vespillo*, *ruspator* and *interruptus*, and quantities of *mortuorum* and *humator*. A single specimen of the somewhat rare *Rhynchites cupreus* was obtained at Heathfield. *Strangalia 4-fasciata* has occurred at Guestling, Heathfield, Battle, and Dallington; and *Chrysomela fastuosa*, near Guestling. *Lampyris noctiluca* has been unusually plentiful this season.—E. P. and H. F. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: October 12th, 1881.

Note on Micralymma brevipenne.—During a recent visit to Barmouth I found *Micralymma brevipenne* crawling about (very sparingly) on old posts and stones near the mouth of a brooklet three or four miles up the Mawddach. The conditions under which it occurred being rather different from those previously known to me (its habitat, according to the “authorities,” being “far below high water mark on the coast”), I thought a record of the capture might be interesting. I have looked through all the volumes of the Ent. Mo. Mag. for notes on *Micralymma*, but, strange to say, in all the seventeen volumes there does not seem to be a single record or note relating to this curious little beetle.—W. G. BLATCH, Green Lane, Smallheath, Birmingham: October 17th, 1881.

Deltocephalus Flori, Fieb., in England.—An insect taken by me among the heather at Esher, Surrey, August 27th, 1874, and hitherto undetermined, has been recognised by Mr. Scott as this species, known previously as British from Scotland only (*vide ante* p. 66).—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 18th October, 1881.

Hemiptera at Hastings.—Perhaps the following may be worth recording: *Acalypta cervina*, a few in the Guestling sand-pit. *Microphysa elegantula*, a single ♀ found walking on a post at Hollington. *Calocoris fulvomaculatus*, one, by sweeping, at Guestling. I was very pleased to get *Stenocephalus agilis* at Hollington, but failed to get more than one specimen. *Sigara minutissima*, I secured one of this, and saw several others at the Pett Ditches. *Salda littoralis* and *lateralis* have been taken at Rye Harbour. *Schirus 2-guttatus* seems to be distributed all over our district. I obtained *Corizus maculatus* at Dallington, but had not determined it in time to include it in last month's list.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: October, 1881.

Sartena amœna.—The discovery of the identity of this species with *Neurothrus iridipennis*, Costa, by Mr. McLachlan (*cf. ante*, p. 89), is very interesting. After a careful examination of a type in my collection with Costa's description and figure (both are not very sufficient), I have no doubt of the identity. I believe also that there is no doubt of the identity with *M. fallax*, Ramb. The types communicated to Rambur by M. Gén  were returned probably, and may be still preserved in his collection.* According to a list of his collection, written and communicated to me in 1857 by De Selys-Longchamps, *M. fallax* and *M. parvulus* were not present among Rambur's types.

Not intending any reclamation, as there is none, I beg to state that I received the *Neuroptera* from Corsica, January 28th, 1862, that I sent my paper June 5th, 1862, and that it was presented to the Society in Paris, July 9th, 1862 (Bull. T., 2, xxxi), but printed only in 1864, with the remark, “S ance, July 9th, 1862.” Of course, I was thus unable to have any knowledge of Costa's publication. Perhaps it is not known to entomologists of to-day how difficult the work was twenty, and even ten, years ago. The only copy of Costa's works then in Germany was in the hands of Senator v. Heyden, in Frankfort, and to his untiring kindness I was indebted for all I knew of these works.—H. A. HAGEN, Cambridge, Mass.: 12th September, 1881.

* Some years ago, the late Prof. Ghiliani informed me that nearly the whole of G n 's types in the Turin Museum had long ago been destroyed by *Anthrenus*!—R. McL.

Drepana sicula.—I have great pleasure in recording my success in breeding *D. sicula* in the autumn of last year, after most diligent search, necessitating a fearful amount of hard work. I took a few larvæ during October, these turned to pupæ; the first specimen (a male) emerged on May 18th; I much regret I could not obtain fertile eggs, for although two pairs were in cop. for over twenty hours, yet the eggs deposited proved unfertile. This season I have spent a great deal of time searching for the moth, but have only been rewarded with one specimen; I have done rather better in collecting the larvæ this autumn. I trust I may be successful in procuring fertile eggs.—W. K. MANN, Wellington Terrace, Clifton, Bristol: October, 1881.

Heliothis armiger, *Gymnancyla canella*, &c., in East Sussex.—On the last Bank Holiday (August 1st) I was on the Camber Sand-hills near Rye, when I found several pupæ of *Depressaria cnicella*, loosely spun up in the leaves of sea-holly, *Eryngium maritimum*, and also took one specimen of the perfect insect. Near the town of Rye I beat *Catoptria candidulana* (*Wimmerana*, D. L.) from sea worm-wood, *Artemisia maritima*. On a subsequent visit (September 13th) to the Camber Sands I saw plenty of traces of the larvæ of *Gymnancyla canella* on *Salsola kali*. I brought away but few of the larvæ, as I had little time to search for them, they were evidently abundant, but some of the larvæ were quite small. On September 24th, I took *Heliothis armiger* resting on a flower in the Rectory garden (at Guestling), and the same afternoon my friend Mr. H. F. Collett brought me a beautiful specimen of *Hoporina croceago*, taken within a short distance of my house.—E. N. BLOOMFIELD, Guestling Rectory: October 11th, 1881.

A fruitless search for the larvæ of Coleophora apicella.—Some correspondents having expressed a wish to have some larvæ of this insect, which I had collected two years ago rather freely on some plants of *Stellaria graminea*, growing in the shelter of furze-bushes on the common at Tunbridge Wells, I took an opportunity whilst staying at Hadlow near Tunbridge, to go over to Tunbridge Wells, hoping to lay in a stock of these larvæ. I returned, however, empty-handed, not having found a single one. This unfortunate result was the effect of the singular meteorological conditions which have prevailed this season. The severity of the winter killed half the furze-bushes on the Common, the long dry time which prevailed from the middle of March to near the middle of August had burnt up all the vegetation on the Common, and it was not till the rainy period which set in (so disastrously for the farmers then busy with harvest) on the 12th August that a revival of vegetation restored some greenness to the aspect of the place, and when I visited it on the 17th September the Common was more luxuriantly green than I had ever seen it.

The *Stellaria graminea* was making up for lost time and was pushing up dense masses of green leaves (on which I found here and there the pretty larvæ of *Hadena pisi*), but it was only occasionally I found its star-like white flowers already expanded and none had yet reached the seed-bearing stage—there was, therefore, positively not an atom of food for any larvæ of *Coleophora apicella*, though in 1879 the first fortnight in September was the very period when I had met with them. This irregularity in the period of flowering and fruiting of its food-plant must surely be very awkward for the larvæ of *Coleophora apicella*, especially if the parent moths deposited their eggs at the usual time.—H. T. STAINTON, Mountsfield, Lewisham, S.E.: September 22nd, 1881.

The larva of Eupithecia inturbata, Hüb., H.-Schf. (*subciliata*, Guen.).—On the 21st of May, by beating a maple-tree (*Acer campestre*), I obtained 5 larvæ of this species, and on another visit 4 larvæ, but on the 30th May no more were to be had, their time being over. The larvæ, in captivity, feed exclusively on the flowers of maple, with predilection for the organs of fructification; they remain quite openly thereon, it being in no way necessary to conceal themselves because their colour entirely accords with that of the flowers, and they are thus almost invisible to their enemies, as well as to entomologists. After a few days they prepared for their transformation, which ordinarily takes place in a spinning interwoven with grains of earth, on the surface of the ground. The first spun its cocoon on the 24th May, the last on the 29th, and 8 days after I found six well-developed pupæ, two imperfectly developed, and in one cocoon a dried-up larva. On the 12th July two male moths appeared, the four others, perfect females, between the 15th and 25th July. The development from the pupa-state occurred regularly between 4 and 6 o'clock in the afternoon. Having in former years captured newly-developed moths at the end of July and beginning of August this earlier appearance must be attributed to the tropical heat of this summer.

The head of the larva is very small, greenish-yellow; the colour of the body is that of their food; the markings consist of a somewhat sharp dark dorsal line and two lighter greenish-yellow sub-dorsal lines, the upper broader and stronger, the lower finer, the two separated by a dark line. The elevated, wrinkled lateral angle of the body forms also a light greenish- or whitish-yellow longitudinal streak, above which the spiracles appear as raised yellowish spots. Under-side and legs of the ground-colour. The pupa anteriorly rusty-yellow; the abdomen greenish. The chitinous pupa-case is so transparent that the development of the moth within can be followed from the first.—Dr. A. SPEYER (*Abbreviated from the Stettiner entomol. Zeitung*, vol. xlii, p. 473: *September*, 1881).

[See also Ent. Mo. Mag., ix, 17, 65, and xiv, 68.—EDS.]

Occurrence of Nepticula sericopeza near Cambridge.—I had often examined the keys of maples about here (Cambridge) for mines of *Nepticula sericopeza*, but hitherto always without success. This year, at the end of August, I took shelter from rain under a solitary maple (*Acer campestre*) just outside the town, and although it was so late in the season, occupied the time in looking over the keys that were within reach. I soon found numbers mined and gathered a lot. The next day I went again and caught sight of a cocoon on an unmined key. Following this clue I soon found many more both on the keys and on the leaves of the maple, and also on the leaves of an elder bush growing beneath. When on a leaf they are in all cases on the upper surface, and when on the keys generally on the extreme tip. The cocoon when fresh is very bright yellow and very neatly spun. Some cocoons which I found were discoloured, dirty white or pink, but these afterwards proved to be empty. I naturally concluded that these cocoons would produce the imago next June, hence I was much surprised the morning after to see a fine *N. sericopeza* roaming about the bag, in fact, they have been emerging every day this month, one or two each day. I have now bred over two dozen with about an equal number of Ichneumons, and there are still more to come out.

Last week I watched a ♀ on the tree, apparently busily engaged in laying her

eggs on the keys—which are still green—so I imagine the second brood has still to feed up, or else there must be a succession of broods throughout the summer. I have found a few cocoons on other maples on the opposite side of the town, where I took a single imago some 20 years since. If the higher boughs of the tree on which I took these cocoons contained an equal number there must have been several hundreds on this one tree, as I gathered over six score from the branches that were within reach of my stick.

I believe the cocoon is described by Mr. Stainton as pink and attached to the *mined* key, but in no single case did I find this to be so. I cannot help thinking that the insect might be easily found in other places where the maples flower freely.—W. WARREN, Merton Cottage, Cambridge: 19th September, 1881.

[The original notice of this larva is by Colonel Goureaux—Ent. Annual, 1864, p. 170—who found it feeding in the keys of *Acer platanoides*, and spinning its cocoon upon the mined key. He describes the cocoons as flat, *yellowish-white, white, or whitish-rosy*. In this case the infested keys had fallen to the ground unripe. The moths emerged at the end of June and beginning of July.—EDS.]

Occurrence of Gelechia scotinella, H.-S., in England.—In April of the year 1873, I collected a quantity of distorted shoots of sloe, from which, among several species of *Lepidoptera*, I bred, at the end of June and beginning of July of the same year, four specimens of a fuliginous *Gelechia* unknown to me. I delayed ascertaining if the species were known to others until I should have discovered its larva, which I hoped to do in the following spring; but when that time arrived circumstances precluded my searching for it, and, by degrees, the matter dropped out of mind. When putting my *Tineina* in order, early in this year, I came across the moths in question, and then forwarded two of them to Mr. Stainton, who obligingly determined them as the *Gelechia scotinella*, H.-Sch. Through the kindness of Prof. Zeller, Mr. Stainton was enabled to inform me that the species had been bred by Herr Sauber at Hamburg, from the same plant; also that the insect has been caught at Prague, Vienna, Jena, and Wiesbaden.

In Staudinger and Wocke's "Catalog," the species is placed before *G. sororculella*. Last spring I visited the place which had yielded me the larvæ, and collected a large number of similarly distorted shoots of the sloe, but none of the contained larvæ pertained to the species required.—J. E. FLETCHER, Worcester: September, 1881.

Leaf-mining larvæ extracted by birds (?).—The larvæ of the genus *Tischeria* are frequently extracted from their mines by some small bird, as I imagine. The exit-hole is larger than would be made by the larva, and the cuticle around is torn, which would not be done by the larva. By the dimensions of the mine, the larva must be nearly full-fed at the time of extraction. The species I have observed most affected in this way are *T. angusticollella*, *dodonæa*, and *complanella*—the first most commonly.—ID.

[Mines of *Lithocolletis* may often be found torn open in a similar way. I fancy some of the Tits are the offenders.—H. T. S.]

Platyptilia dichrodactyla and *Bertrami*.—After the appearance of Dr. Jordan's first paper on the *Pterophori* of Europe and North America compared, in one part of which he made some references to the identity of the two plumes above named, I wrote him a few lines, embodying my experience of one of them, *dichrodactyla*. Dr. Jordan, in the kindest manner, desired me to communicate them to the Magazine, as he thought there were some points of interest bearing on the question of

the identity of the two insects. Perhaps, no one in this country[†] has had more practical experience of *P. dichrodactyla* than myself. I have bred it for a number of years. With us, it is the only species, *Bertrami* not having occurred in any part of our district. The larva (of which I sent examples this summer to Mr. South for figuring) feeds, with us, invariably in tansy. I have never found any trace in yarrow. The imago fades—especially out of doors—sooner than any other I have any experience of; for I never took an example at large which was not more or less bleached: generally, they are almost white. The examples which are bred indoors must be boxed as soon as possible, and killed; as even in the house, two or three hours of exposure suffice to make them decidedly paler. My only captures of *Bertrami* have been made at Witherslack, where it seems pretty abundant. Now, I never took a faded one; they were all well coloured: so, one would fancy that if they were identical, the food-plant must have caused a very complete alteration in the qualities of the colouring matter of the scales. We must not forget, too, that *dichrodactyla* is nearly a month later in appearance than *Bertrami*. For this I quote Mr. Stainton's remarks on the two species in this Magazine, vol. ii, page 137.

The colouring of the bred *dichrodactyla* is—in water-colour nomenclature—nearly pure Indian yellow, clearly marked and streaked with a pale shade of the same colour, and with the few costal and fringe markings and spots dark brown to black; the markings clear and decided, with invariably a very clear, small, black spot just below the fissure: in some examples also one above, united by a brown shade, as in *serotinus*.

The colour of *Bertrami* is shades of fawn-colour and brown, the darker shades indistinctly margined, mere washes of colour, not sharply laid on like those in *dichrodactyla*. The spot near the fissure, when present at all, is exceedingly faint.

The palpi, in *dichrodactyla*, are decidedly longer than in *Bertrami*. The hooked apex, which, in some specimens of *Bertrami*—probably females—is well-marked, and on which Dr. Jordan lays some stress, will be found, on close examination, to have a different shape in the two insects. In *dichrodactyla* the hook is much more emarginate on the lower side, so that it comes to a much finer point than in *Bertrami*.

One may easily see that, in localities where both species occur, the confusion that may exist among caught, or carelessly-bred, examples, which, when mixed up, will become almost hopelessly entangled.

The above points, in addition to the great difference—in bred examples—of the leg markings, so well defined by Mr. Stainton, give, in my opinion, strong grounds for their separation, even should the coloration of the larvæ be similar. *Dichrodactyla* does not hibernate in the imago state. The female oviposits at night—most usually quite after dark—with its abdomen thrust down among the disc florets of the tansy flowers. One egg will—probably—be laid in each flower, and the larva must emerge soon after (as the plant dies down in winter), and mine down the stem into the root, where it remains until the fresh shoots are thrown up in the following spring, up which it works as the plant grows; throwing out frass from the joints, and causing the whole plant to droop, very like the effects produced by the larvæ of *Exaretia Allisella* in the stems of *Artemisia vulgaris*, and becoming full-fed about the end of June.—J. SANG, Darlington: October 8th, 1881.

Obituary.

W. Garneys.—We record with deep regret the sudden death from apoplexy, on the 21st October, at Repton, near Burton-on-Trent, of Mr. W. Garneys, one of our oldest correspondents, who never relaxed his study of our indigenous *Coleoptera*, in spite of arduous professional duties. A more complete notice will appear in our next number.

NOTE ON *ÆPOPHILUS BONNAIREI*, SIGNORET; A GENUS AND SPECIES OF *HEMIPTERA* NEW TO BRITAIN.

BY CHAS. O. WATERHOUSE.

Recently I took some British *Hemiptera* to Mr. Edward Saunders for identification, and the first species in the box he determined to be *Æpophilus Bonnairei*, of Signoret. The specimens are marked in the late Mr. F. Smith's hand-writing, "Polperro, Cornwall," and they appear to have been mounted by him, but I cannot ascertain whether they were captured by him or not. A full description of the genus, accompanied by a good figure with details, will be found in the *Tijdschrift voor Entomologie*, 1880, p. 1, pl. 1; but the original notice is in the *Bulletin de la Société Entomologique de France*, 1879, p. lxxiii (*cf.* *Ent. Mo. Mag.*, xvi, p. 68), where the species is said to have been found in the Ile de Ré, at low water, under stones deeply imbedded in the mud, and in company with the Coleopterous insect, *Æpus Robinii*. It measures two lines in length, is of rusty-yellow colour, with dusky head and abdomen, the hemielytra a little longer than the thorax and acuminate. Its appearance is more that of a larva than an imago; and I am not sure that a non-Hemipterist might not at first sight mistake it for a narrow larval form of the common house-bug, *Acanthia lectularia*.

British Museum:
November 3rd, 1881.

ON TWO NEW SPECIES OF BUTTERFLIES FROM EAST AFRICA.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

The two following species were obtained this year from a collection of *Lepidoptera* sent home by Sir J. Kirk.

NYMPHALINÆ.

CHARAXES KIRKII, *sp. n.*

♀. Intermediate in character between *C. Etheocles* and *C. Viola*, but most like the latter, from which it differs in the form of the ochraceous belt across the primaries, which agrees exactly with the white belt of *C. Etheocles* in shape; in the almost entire absence of the purple shot at the base of the wings; the primaries being suffused towards the base, at the apex, and along the external border, with rusty- or cupreous-brown; the greater width of the dark external area of these wings; the considerably narrower belt across the secondaries, which is almost central, tapers slightly towards the abdominal area, its inner edge straight, its outer edge slightly sinuous; the upper part clouded with ochreous, the lower half indistinctly bordered with lilac; owing to the narrowness of this belt, the external black area is

of three times the width of that in *C. Viola*; the sub-marginal spots are smaller, and the red and green marginal border duller; abdominal area broadly pale greenish-grey: under surface altogether different, glaucous-grey, the black markings much more prominent, broader; a distinct white belt beyond the middle of the wings; the lunated red discal markings of the primaries replaced by a series of spots between the upper radial and sub-median veins, the first three indistinct, dusky, the last three black; the discal lunated series of the secondaries darker and duller, and the ill-defined band limiting the basal area on these wings narrower, less irregular, and better defined.

Expanse of wings, 75 mm.

Mamboia, E. Africa (*Sir J. Kirk*).

By referring to my figure of *C. Viola* (Proc. Zool. Soc., 1865, pl. xxxvi, fig. 4), it will be easy to identify this insect; its proper location is evidently between this species and *C. Jocaste*, of Senegal.

TERACOLUS INCRETUS, *sp. n.*

♀. Very near to the female of *T. Auxo*, but considerably larger; all the dark brown markings better defined and broader, the external border of the primaries being decidedly broader, and the macular orange area between it and the connected series of discal black spots of little more than half the width, and much more arched; the discocellular spot of about four times the size; the discal markings of the secondaries so well marked as to indicate an irregular zigzag line, the first, second, and fourth divisions of which are dark brown, the last-mentioned being a cuneiform brown spot; the marginal spots very large: wings below altogether brighter and clearer in colour, the markings better defined; the discocellular spot of primaries pupillated with silver, that of secondaries consisting of a partially black-edged silver spot with ochraceous iris.

Expanse of wings, 55 mm.

Mamboia, E. Africa (*Sir J. Kirk*).

The female of *T. Auxo* expands 43 millimètres, that of the closely-allied (if distinct) *T. Topha*, 42, that of *T. Keiskamma*, 43; so that *T. incretus* may be safely said to exceed all its nearest allies by 12 millimètres in expanse of wing.

British Museum: *October*, 1881.

DESCRIPTION OF A NEW SPECIES OF SATURNIIDÆ FROM THE GOLD COAST.

BY W. F. KIRBY.

ANTHERÆA MACROPHthalmus.

Expanse, 5 inches. Warm fawn colour, shading almost into salmon-colour on the hind-wings; fore-wings with the basal line consisting of a rather indistinct pinkish-white line, bordered with black within, straight across the cell, forming a rectangle below, and ceasing half-way between the sub-median nervure and the inner margin; eye of moderate size, not quite round, paler than the ground colour,

without pupil, but enclosed by narrow black and pinkish-white lines, the latter with a few pink scales on the outside; sub-marginal line pinkish-white, near and almost parallel to the hind margin, very slightly undulated, and a little eurved outwards at the anal angle; slightly bordered with black outside and with pink inside. Hind-wings with the basal stripe blackish, nearly straight, and ceasing before reaching the inner margin; eye large, nearly of the ground colour, pupil of moderate size, scaleless above, but scaled below, except its vitreous outer edge; this eye is surrounded with black, red, and pale pink rings, the latter broadest and produced into a pear-shape; the point rests on the basal stripe, and the opposite side extends nearly to the sub-marginal pinkish-white stripe, which forms a half-circle round the eye, and then turns downwards towards the anal angle; this stripe is indistinctly edged with pink within, but bordered with a black stripe of equal width on the outside.

In the collection of Mr. G. A. Higlett.

Notwithstanding its superficial resemblance to *Caligula Suraka*, Boisd., from Madagascar, this appears to be more closely allied to *Antheræa Hersilia*, Westw., from the Congo, than to any other described species.

British Museum:

October, 1881.

DESCRIPTION OF THE LARVA OF *SCOPULA LUTEALIS*.

BY WILLIAM BUCKLER.

It is a great satisfaction to have figured, and to be able to strike off another *Pyræle* from my desiderata, and for this I render many grateful thanks to Mr. W. H. B. Fletcher, who most kindly sent me three examples of this larva on 28th of June last.

They were feeding on tender leaves of some species of *Rubus*, and with me they partook freely of *R. corylifolius* and sparingly of *Stachys sylvatica*.

In course of a week they spun up amongst the bramble leaves, and the first two moths emerged on 18th of July and the third on the 21st, all three males.

From a previous account of this larva I was prepared to expect a close resemblance to that of *prunalis*, and was the more agreeably surprised to see how very distinctly different they were in point of colouring,—though in form and design they agreed with that species.

When I received them they were all three alike, though two were nearly full-fed, while the third larva was in perfect condition and beauty of colour; and I venture to suppose that the notes taken at the time it was figured may perhaps have some interest.

The length of the full-grown larva is three-quarters of an inch or a trifle more, the form tapering much anteriorly and a little posteriorly, the well-defined segments plump on the belly, and subdivided on the back near the middle of each by a deep wrinkle; the colour of the head is pale semi-pellucid yellowish-brown blotched with a deeper tint of the same, the second segment is of a bright transparent yellowish-green, and near the end of this two sub-dorsal stripes begin at first as mere lines, but gradually widen through the third and fourth and from thence are uniformly very broad of opaque *primrose-yellow*, relieved above by a narrow dorsal stripe of the transparent green, and below by another stripe of this colour which melts into the pale whitish-greenish tint of the belly just where the pale tracheal thread shows faintly; the anal flap is of sulphur-yellow; the pale spiracles extremely small; the slightly raised tubercular warts are of the ground colour where they occur, but those on the yellow have a central dot of green, and from each wart proceeds a fine pale hair; the skin is glossy throughout. In short this larva is extremely like that of its congener *prunalis*, but with the important and striking difference that the sub-dorsal regions are primrose-yellow instead of white.

When quite full-fed it loses its distinctness of colours and becomes just before spinning up of a semi-transparent light amber-yellow all over.

The cocoon is the lining of a cavity formed by folding down the side of a leaf or otherwise contrived between two leaves, made of white silk, thin but strong, of oval form, and half-an-inch in length: the pupa is three-eighths of an inch long, broadest across the well-produced thorax, the wing-covers of moderate length, the leg- and antenna-cases a little longer and free at the end, the fixed segments of the abdomen are slightly keeled on the back and have very large spiracles, while those on the movable and tapering segments are of ordinary size, each segment has five or six transverse ridges, the most prominent being at the hind edge; the anal tip ends in a pointed and flattened prolongation furnished with curly-topped converging spines firmly fixed in the silken cocoon; the whole surface is black, and dull generally, though glistening a little on the back, and is only really glossy on the two hinder segments; moreover, with a strong lens a few fine hairs are just visible, that is, one from each wart where these traces of the larval skin still remain.

DIPTERA OF THE NORFOLK BROADS.

BY G. H. VERRALL.

During the last half of June, I had the opportunity of collecting among the Norfolk and Suffolk Broads, and a list of my captures, with a few notes, may be of interest. The neglect this district has experienced of late years, and the astonishing ignorance as to its character and extent, which so widely prevails, are, I suppose, attributable to the late inaccessibility except by boat; but by making Yarmouth the head-quarters, and using the new East Norfolk Railway, many of the Broads, such as Hickling, Ormesby, Filby, and Martham, are fairly accessible, and this is by far the most convenient method of working the district, as scarcely any accommodation can be obtained in the villages. The lakes are grand sheets of shallow fresh water, with reedy, marshy, or well-timbered edges, affording most perfect spots for a naturalist to work on, and they have apparently changed but little for many centuries, hence they teem with life both entomological and ornithological.

My hopes of obtaining some novelties to Britain were not doomed to disappointment, as besides what may remain among my unnamed *residuum*, I certainly obtained in quantity one very lovely *Dolichopus* (*Gymnopternus chalybeus*, Wied.) quite new to Britain, and a specimen of the curious and puzzling *Graphomyia picta*, Zett.

As localities for English *Diptera* are very few, I give a full list of the species I have recognised: when no locality is given, the species may be considered of general distribution.

<i>Microchrysa polita</i> (Hickling)	<i>Dolichopus signatus</i> (Martham)
<i>flavicornis</i> (Hickling)	<i>urbanus</i> (Fritton)
<i>Sargus infuscatus</i> (Martham)	<i>nitidus</i> (Martham)
<i>Beris vallata</i> (Hickling)	<i>griseipennis</i> (Martham)
<i>Hæmatopota pluvialis</i>	<i>sabinus</i> (Lowestoft)
<i>Leptis scolopacea</i>	<i>simplex</i>
<i>Chrysopilus auratus</i>	<i>brevipennis</i>
	<i>æneus</i>
<i>Thereva annulata</i> (Sandy Coasts)	<i>Gymnopternus cupreus</i>
<i>bipunctata</i> (Cromer)	<i>celer</i> (Martham)
<i>Dysmachus trigonus</i> (Lowestoft)	<i>metallicus</i> (Fritton)
<i>Empis stercorea</i> (Fritton)	<i>chalybeus</i> (Martham) [1]
<i>Hygroceleuthus diadema</i> (Lowestoft)	<i>ærosus</i>
<i>Dolichopus vitripennis</i> (Hickling)	<i>assimilis</i> (Martham & Hickling) [2]
<i>atratus</i> (Hickling)	<i>nanus</i> (Ormesby & Fritton)
<i>lepidus</i> (Hickling)	<i>Hypophyllus obscurellus</i> (Fritton)
<i>nubilus</i>	<i>Argyra diaphana</i>
<i>claviger</i> (Fritton)	<i>argentata</i> (Martham)
<i>plumipes</i>	<i>leucocephala</i> (Fritton)
<i>pennatus</i>	<i>Synarthrus pallipes</i> (Lowestoft)
<i>popularis</i>	<i>monilis</i> (Hickling)

<i>Chrysotus cupreus</i> (Martham)	<i>Helophilus hybridus</i> (Ormesby and Martham)
<i>neglectus</i> (Martham)	<i>pendulus</i>
<i>gramineus</i> (Martham)	<i>versicolor</i> (Ormesby & Martham)
<i>Sympycnus annulipes</i>	<i>frutetorum</i> (Ormesby & Martham)
<i>Campsicnemus scambus</i> (Martham)	<i>transfugus</i> (Martham)
<i>curvipes</i>	<i>lineatus</i> (Ormesby and Martham)
<i>armatus</i> (Lowestoft)	<i>Xylota segnis</i> (Martham)
<i>Liancalus lacustris</i> (Lowestoft)	<i>Thelaira leucozona</i>
<i>Hydrophorus bipunctatus</i> [3]	<i>Sarcophaga carnaria</i>
<i>litoreus</i> (Martham & Ormesby)	<i>melanura</i> (Lowestoft)
<i>præcox</i> (Ormesby)	<i>Graphomyia maculata</i>
<i>viridis</i> , <i>Mg.</i> ? (Ormesby) [4]	<i>picta</i> (Martham) [8]
<i>Medeterus petrophilus</i> , <i>Kow.</i> ? (Cromer and Lowestoft)	<i>Calliphora greenlandica</i> (Lowestoft) [9]
<i>Thrypticus bellus</i> (Ormesby)	<i>Morellia curvipes</i> (Hickling) [10]
<i>Xanthochlorus ornatus</i> (Fritton)	<i>Polietes albolineata</i> (Hickling)
<i>Pipizella virens</i> (Ormesby)	<i>Hyetodesia lucorum</i>
<i>biguttata</i> (Martham)	<i>incana</i> (Hickling and Ormesby)
<i>Pipiza noctiluca</i> (Ormesby)	<i>errans</i> (Lowestoft)
<i>Chrysogaster splendida</i> (Martham) [5]	<i>rufipalpis</i> (Ormesby and Fritton)
<i>splendens</i> (Ormesby)	<i>basalis</i>
<i>Macquarti</i> (Hickling)	<i>Mydæa pagana</i> (Fritton)
<i>chalybeata</i> (Martham & Hickling)	<i>urbana</i>
<i>cæmeteriorum</i> (Martham)	<i>quadrum</i> (Fritton)
<i>Chilosia pulchripes</i> (Hickling)	<i>Aspilota allotalla</i> (Martham)
<i>chloris</i> (Ormesby)	<i>Hydrophoria conica</i>
<i>flavimana</i> (Hickling and Martham)	<i>Hylemyia strigosa</i> (Fritton)
<i>variabilis</i> (Hickling and Martham)	<i>nigrimana</i> (Fritton)
<i>Pyrophæna ocymii</i> (Ormesby and Martham)	<i>Anthomyia pluvialis</i>
<i>rosarum</i> (Martham)	<i>inanis</i> (Martham)
<i>Platychirus manicatus</i>	<i>Homalomyia canicularis</i>
<i>albimanus</i>	<i>Lispe tentaculata</i>
<i>peltatus</i> (Hickling)	<i>Actora æstuum</i> (Yarmouth)
<i>fulviventris</i> (Martham) [6]	<i>Dryomyza flaveola</i> (Fritton)
<i>Syrphus auricollis</i> (Martham)	<i>Tetanocera ferruginea</i> (Hickling)
<i>corollæ</i>	<i>reticulata</i>
<i>latifasciatus</i> (Martham)	<i>Sepedon spinipes</i> (Hickling)
<i>Sphærophoria picta</i>	<i>Calobata cibaria</i> (Fritton)
<i>Ascia floralis</i> [7]	<i>Trypeta cylindrica</i> (Martham)
<i>Rhingia rostrata</i>	<i>Oxyphora miliaria</i>
<i>Volucella bombylans</i>	<i>Balioptera tripunctata</i> (Yarmouth)
<i>Eristalis sepulchralis</i> (Ormesby)	<i>Scatopse halterata</i>
<i>intricarius</i> (Martham)	<i>Pericoma nubila</i> (Fritton)
<i>horticola</i> (Ormesby)	<i>fusca</i> (Fritton)

NOTES.

(1) *Gymnopternus chalybeus*, Wied.—This is a rather large dark purplish insect with darkened wings, utterly unlike any other European species. The cilia behind the eyes are all black, the antennæ shortish, yellow at the base, 3rd joint triangular, the epistoma white, *frons* blue; legs yellow, hind femora black at tip, hind tibiæ darkened, black at tip, tarsi all black, except base of front pair. It was

abundant amongst the low herbage, and on the water dock, on the marshy flat land at the northern end of Martham Broad. The *D. chalybeus* of Stephens' list was, probably, as Haliday remarks, the *D. chalybeus* of Meigen, which is only a variety of *D. æneus*, Deg.

(2) *Gymnopternus assimilis*, Stæg.—I am very suspicious that we have more than one species under this name. True *G. assimilis* resemble *G. ærosus*, Fall., but have a silvery instead of black face, but the specimens caught here, besides some others I possess, have also the lamellæ of the hypopygium reddish instead of blackish. The British species of this genus will well bear close examination; to the eleven in Walker's *Insecta Britannica*, I have now added nine, one of which, however, (*G. angustifrons*, Stæg), though named by Loew, is, I fear, only a small *G. cupreus*, Fall.

(3) *Hydrophorus bipunctatus*, Lehm.—When a slight ripple prevented this species from running about freely on the water, it was in countless thousands on the edges of the lakes.

(4) *Hydrophorus viridis*, Meig.—True *H. viridis*, Mg., has a white face; however, a specimen I once caught at Hendon, which was named *viridis* by Loew in spite of an orange face, is clearly identical with the one specimen I caught at Ormesby. At Martham I caught one other specimen with an orange face, but this is clearly distinct, and the same as a species of which I once took one at Seaford. I do not like to describe new *Hydrophori* from such poor material, and I possess a third species in one specimen from the little stream which crosses the road at the foot of Loch Callater, which seems undescribed. Of all the other British *Hydrophori* I possess full series.

(5) *Chrysogaster splendida*, Mg.—I have no doubt as to the naming of this species (new to me), though the tarsi show but very faint signs of yellow, yet the reddish under-side of the third joint of the antennæ clearly distinguishes it from *C. metallina*, F.; I failed to distinguish it when catching it.

(6) *Platychirus fulviventris*, Macq.—This species is readily distinguished from its allies by its entirely yellow femora and tibiæ; also, from *P. scambus*, Stæg. and *P. immarginatus*, Zett., by the tolerably abundant equal pubescence behind the front femora; those two species having about six long black hairs extremely distinct from the shorter pubescence. It agrees with these two species in the large extent of the yellow spots on the abdomen, and therefore differs in this from *P. clypeatus*, Mg., *angustatus*, Zett., and *podagratus*, Zett., all of which also have the hind femora and tibiæ with a broad blackish ring. I caught only one at Martham, but I find I took one a year ago at Burwell Fen.

(7) *Ascia floralis*, Mg.—This was very abundant at Martham, and had all the usual variations, which I cannot help thinking include *A. quadripunctata*, Mg., and *A. dispar*, Mg., and possibly even more so-called species.

(8) *Graphomyia picta*, Zett.—I captured one male of this at Martham Broad. The first notice of this supposed species was made by Zetterstedt, in 1845, under *Cyrtoneura maculata*, Dipt. Skan., iv, 1356, as a singular variety of the male, in which that sex has the colouring of the female. He, however, speaks of it as taken by Wahlberg in one place "(Cedershal prope Holmiam) in pluribus exemplis." Wahlberg subsequently (1852), in the notes of his travels, incidentally mentioned it

as *C. cæruleseens*, and Zetterstedt, in 1855 (Dipt. Skan., xii, 4715), fully described it as a separate species, *Cyrtoneura picta*, professing to recognize some other slight differences, such as whiter alulæ, narrower frontal triangle, less oblique transverse vein, &c. He had apparently then seen several specimens from Sweden and Lapland. I believe there is no notice of its having occurred elsewhere, and, though I consider the specimen of extreme interest, I must still hold doubts of its specific rank.

(9) *Calliphora grænlandica*, Zett.—The common oblong, somewhat flattened, dark blue *Musca*, common in London, and apparently occurring all over England and Scotland, existing in English collections sometimes as *M. equestris*, sometimes *M. illustris*, and sometimes *M. azurea*, is, I believe, Zetterstedt's *C. grænlandica*, as the palpi are yellowish, and the thorax and abdomen all of one colour in both sexes.

(10). *Morellia curvipes*, Meq.—All (4♂) belong to a small var. I find this species common in numerous localities.

Sussex Lodge, Newmarket :

October, 1881.

NOTES ON BRITISH TORTRICES.

BY C. G. BARRETT.

(continued from Vol. xvii, p. 267).

In this Magazine for 1869 (vol. vi, p. 113), I recorded the curious habit of a larva which I had found feeding in berries of *Rhamnus frangula* at Haslemere, and, when full-fed, forming a case out of a piece of the leaf, in which to pass the winter, and stated my reason for believing it to be that of *Eupæcilia ambiguella*.

As far as I know, this observation remained for more than ten years unchallenged and unconfirmed, so it will not be difficult to imagine the pleasure with which I received, in the summer of 1880, a letter from my energetic friend, Mr. W. H. B. Fletcher, in which he wrote: "I came down to the New Forest for a week in March, and, when searching for cases of *Coleophora ahenella* on the *Rhamnus frangula* stems, I found some queer bottle-shaped cases on the stems, formed of a piece of dead oak-leaf or bracken-frond. Towards the end of April, a fine *ambiguella* came out indoors. It seems a queer idea that the larva should feed on *Rhamnus*, then take the trouble to go to the ground to make a case of oak or fern, and then return to the stems to hibernate and pupate."

This was gratifying, and I begged Mr. Fletcher to search for larvæ in the berries, in the summer. This he did, and sent me a grand supply of berries containing scores of larvæ. These larvæ were slug-gish and plump, thickest in the middle, with slightly swollen segments. Colour, dirty pale brownish-yellow, with the internal dorsal vessel

hardly perceptible; spots large, shining, and prominent, slightly darker than the body, but apparently without hairs; head and dorsal plate shining jet-black; anal plate light brown; anterior feet black. Very little change in colour during growth until full-fed, when the reddish tinge was sometimes assumed. Feeding inside the unripe berries of *Rhamnus frangula*, hollowing out the hard seeds as well as eating the pulp, and, when one berry was exhausted, fastening it to another with white silk, the same operations being continued until several berries were united together and their contents eaten; but the first emptied berry being used as the habitation, and frass extruded through a hole in it. Sometimes the berries were also strongly joined to dead or living leaves, which, however, were not eaten. These larvæ seem to have fed through July, since some were full grown on the 29th, while others continued to feed until the middle of August. They were not supplied with dead leaves, other than the drying *Rhamnus* leaves, and, when full-fed, they left the bunches of berries and rolled up portions of these leaves into cylinders, cutting off portions of these cylinders to form cases. These cases were roughly formed, and the edges not carefully joined; but the larvæ carried them about until they settled down on the sides of the pots or the gauze covers for hibernation. Great care was taken to afford them as natural a condition for passing the winter as was possible, but the result was very meagre, only two specimens survived the winter, and emerged in the following spring. The cold was unusually intense, and nearly all my hibernating *Tortrix* larvæ perished. The difficulty of wintering them is always very great. I could not find that any other larvæ in the cases entered the pupa state.

It does not, however, seem certain that the larva of *ambiguella* always follows the general rule among this group of *Tortrices*, of hibernating in the larva state. Mr. Fletcher's subsequent observations on this point are of so great interest, that I venture to quote them *verbatim* :

"I spent March 3rd to 10th, 1880, in the New Forest, partly that I might search stems of *Rhamnus frangula*; when so doing, I found a few cases which afterwards yielded the moth in question: one of these cases I opened to see if the tenant were Lepidopterous, this case certainly contained a larva. I took several more cases in the autumn of 1880, and opened six or seven; all these contained pupæ. A local collector also called my attention to these pupæ, because I had told him the larva did not change till the spring. These are the 'facts of the case,' so far as they have come under my eye. I can only guess

they are remnants of the many-broodedness of the insect on the continent. 1879 was a cold, wet season, hence *ambiguella* may have only meant to do a single brood, and so did not pupate until the spring of 1880. August, 1880, on the other hand, was hot and dry. May not the larva have thought to run through another cycle of existence, and have accordingly pupated, and had its further development stopped by the break-up of the weather about September 10th? However, these are but guesses. The larva is not dainty as to the material of its case, some use the leaf of *Rhamnus*, others that of the oak or a piece of the bracken-frond; I have one made of the bark of the honeysuckle, and another has tacked a 'hair-pin' from the Scotch fir to its case."

Here is material for thought!

It is singular that continental authors make no mention of these cases. Dr. Hofmann quotes Von Roser's "*Observations on the worm of the Grape*.—Red-brown, with four pale, somewhat transparent spots on each segment, and a tuft of hair in the middle. Head dark brown. In several generations on vine. The first brood in the flowers which it draws together, the second in the unripe, and the third in the ripe berries (grapes), out of which the excrement is observable. It is very mischievous. It pupates in the flowers or on the stem. Imago in from fourteen to eighteen days, the last brood emerging in the spring."

This does not seem to agree very well with our insect, yet the perfect insects are precisely alike, and Prof. Zeller assures me that *ambiguella* is found on the continent in woods where there are no vines, as well as in the vineyards.

Pembroke: 12th November, 1881.

ON CERTAIN SOUTH AMERICAN DELPHACIDÆ.

BY JOHN SCOTT.

Dr. C. Berg, Professor in the University of Buenos Ayres, was so kind as to forward me a copy of his work the "*Hemiptera Argentina*," a review of which appeared at page 90 of the present volume of this Magazine, and, having carefully perused the same, I observed that he had described a *Liburnia* under the name of *cognata*, a name previously given to a species of this genus by the late Dr. Fieber. I thereupon wrote to him calling his attention to the fact, and requesting him to be good enough to permit me to see all his species of this group. He at once sent me a box containing his types and other examples which, having assorted and arranged according to the

Fieberian Catalogue, I have returned, and have left Professor Berg to deal with them as he sees fit in his forthcoming volume of Addenda, with the exception of the following:—

Family DELPHACIDÆ.

EUIDES FUSCO-VITTATA, *n. sp.*

♀. Pitchy-brown. *Head*: crown pale brown, pale straw-yellow at the base; *frons* and *face* pitchy-brown; *keels* pale brownish-yellow, lower margin concave, somewhat yellow; *clypeus* brownish-yellow; *antennæ* yellowish or pale brownish-yellow, 2nd joint granulated. *Pronotum* shining, pale straw-yellow, sides brown from a little way beyond the extremities of the keels. *Scutellum* shining, pitchy-brown. *Elytra* clear, transparent; *corium*: nerves yellowish, finely granulated, nerves of the apical areas black, finely granulated; *clavus* with a longitudinal brown streak down the area, enclosed between the anal nerve and suture, apex of the area enclosed between the anal nerve and dorsal margin with a short black streak. *Legs* yellow. *Abdomen* above black, three or four terminal segments on the sides broadly yellow. Length, $2\frac{1}{2}$ lines.

I have only seen a single female example which, by the character on the elytra alone, differs from all the species known to me.

The insect described by Professor Berg under the name of *Liburnia nimbata*, has really nothing whatever to do with the genus, nor, indeed, with any of the other genera of *Delphacidæ*, and I have, therefore, characterized it as follows:—

BERGIA, *n. g.*

Head: crown barely twice as long as broad, with a longitudinal central, and two short keels, in front, the latter almost joined in the middle of the anterior margin; *face* nearly equal in length to the breadth between the antennæ, with two longitudinal keels slightly widening from the lower margin of the frons to the apex; *clypeus* about as long as broad, measured across the base, without a central longitudinal keel; *antennæ*: 1st joint about half the length of the 2nd; *eyes* somewhat large. *Pronotum* with a central longitudinal, and two side, keels, posterior margin concave across the scutellum. *Scutellum* triangular, apex acute, with five longitudinal keels, the central one not reaching to the apex, and the side ones vanishing before reaching the side margins. *Elytra* as in *Cixius*, *Oliarus*, &c., but the furcate apical areas are longer than in these genera. *Legs*: *tibiæ*, 3rd pair with three spines on the outer margin, nearly equidistant from each other, placed, one at the base, another before, and the 3rd beyond, the middle; *tarsi*: 3rd pair, 1st joint almost twice as long as the 2nd.

This genus appears to be one of the connecting links between the *Delphacidæ* and the *Cixiidæ*. The head is somewhat similar to *Euides*, as viewed from above, but the broad face with its two keels completely shuts out any relationship with that genus. The scutellum with five keels brings it near to *Oliarus*, but the face here is also totally different

in form. It also bears some slight resemblance to *Ugyops Kinbergi*, Stål (Eugenies Resa, 274, 156, tab. iv, fig. 2), but the crown and antennæ are much too long, and the keels on the face entirely dissimilar; the hinder tibiæ alone bearing spines, as in this new genus.

I have much pleasure in naming the genus after Dr. C. Berg, for his kindness in forwarding to me his specimens of this group.

LIBURNIA BERGI.

The name *Liburnia cognata*, Fieb., having been unknown to Dr. Berg when he published his work, I propose to re-name his species of this name *Liburnia Bergi*, and so get rid of any confusion, although I believe Fieber's species to be *L. Aubei*, Perris.

Lee, S.E.: 13th November, 1881.

NEW CETONIIDÆ FROM EAST CENTRAL AFRICA.

BY H. W. BATES, F.R.S.

The following interesting species, new, with the exception of *Ceratorhina princeps*, of which the ♀ has previously been made known, are from the neighbourhood of Mamboia and Mpwapwa, villages situated in wooded districts at 3000 to 4000 feet elevation, in Eastern Africa, 160 and 200 miles distant, respectively, from the coast at Saadani.

HYPSELOGENIA CORROSA.

♀. *Breviter ovata, castaneo-fusca, fronte elongata concava, scabropunctata medio tuberculata, marginibus acutis elevatis, ante oculos verticaliter angulatis, clypeo late bidentato: thorace brevi, transverso, lateribus fortiter rotundatis, margine antico supra caput elevato, postico ante scutellum minime sinuato, grossissime hic illic confluentur punctato, margine lato guttisque nonnullis ochraceo-tomentosis: elytris grossissime, confluentur, latera versus sub-seriatim, punctatis, costis vix distincte elevatis; margine apicali lituris transversisque ochraceo-tomentosis: subtus castaneo-rufa, punctata, abdomine utrinque fasciis quatuor ochraceis.* Long. 10 lin.

CERATORHINA EUTHALIA.

♀. *C. Smithii affinis, sed differt elytris planioribus, thorace multo distinctius punctulatis: fronte, thorace, scutello, corporeque subtus late prasinis; clypeo femoribus tibiisque rufis, tarsis nigris, elytris flavis utrinque maculis duabus (humerali et apicali) nigris.* Long. 18 lin.

CERATORHINA PRINCEPS (Oberthür).

♂. *C. guttata (Oliv.) similis sed multo magis convexa; clypei cornubus longioribus, verticaliter curvatis, supra longitudinaliter concavis, marginibus acutis parallelis, cornubus frontalibus nullis, sed occipite ut in Cælorhina*

horizontaliter producto bidentato: læte castaneo-fulva, viridi-æneo relucens, thorace magis viridi, nitido, convexo, medio nigro bipunctato: elytris ut in C. guttata utrinque guttis circa 13 ochraceo-tomentosis. Long. 12—15 lin.

M. René Oberthür, in Ann. Soc. Ent. Fr., 1880, Bull. p. cxix, briefly described the ♀ of this most interesting species.

CERATORHINA BURKEI, var. HISTRIO.

♂ ♀. *A. C. Burkei differt utroque sexu thorace angustius albo-marginato vittaque dorsali rufa, et elytris maculis oblique geminatis discoidalibus longe distantibus.*

ECCOPTOCNEMIS RELUCENS.

♂ ♀. *E. Thoreyi robustior et convexior, rufo-castanea, nitida, thorace lateribus alutaceo-opaco, tibiis et tarsis nigris, elytris viridi relucens, ubi opalescentibus. Long. 11—16 lin.*

HETERORHINA (ANISORHINA) LÆVICAUDA.

A. flavomaculatæ proxime affinis; minor, gracilior, et fascia flava postica angustiori, per elytrorum apicem fere ad suturam continuata, area politissima includenti, distinctissima. ♀. Tibiis anticis extus bispinosus. Coloribus ut in A. flavomaculata. Long. 10 lin., ♂ ♀.

HETERORHINA (ANISORHINA) ELONGATA.

A. umbonatæ coloribus simillima, sed differt corpore multo magis elongato capiteque ♂ suprâ carina angusta mediana, clypeoque margine fortiter recurvo bidentato. Elongata, subtus nigra, nitida, sternis lateribus, abdominisque apice fulvis, thorace castaneo-rufo, polito, medio nigro, lateribus sparse punctatis; scutello fusco-castaneo: elytris suprâ planatis, striis punctatis, geminatis, subtilibus, interstitiis sparsim punctatis, flavo-testaceis sutura fusca; pedibus rufis: ♀ tibiis anticis extus tridentatis. Long. 7—11 lin., ♂ ♀.

HETERORHINA TRICOLOR.

♂. *H. speculari similis, sed brevior et latior, nigra, nitida, thorace sanguineo vitta mediana nigra, elytris vitta lata laterali (callum humerale haud tegenti) maculaque sub-apicali prope suturam, flavis: abdominis segmentis duobus terminalibus rufis, medio nigro-maculatis: clypeo quadrato, margine antico obtuse bidentato, fronte concava sub-lævi, cornu occipitali porrecto paullulum elevato: thorace (medio lævi excepto) elytris sparsim punctatis. Long. 8 lin.*

PLÆSIORHINA UNDULATA.

A. Pl. plana differt colore castaneo-fulva, viridi-ænea tincta, fasciaque flava angusta undulata et nigro-marginata. Oblonga, deplanata, nitida, thorace crebre, elytris sparsius et subtilius punctatis, vitta flava marginali pronoti angulum posticum attingenti; capite corpore subtus pedibusque pallidius fulvis, æneo-tinctis. Long. 11½ lin.

Coleoptera at Chirique.—A little while ago I had a short letter, dated September 5th, from Mr. G. C. Champion, who has so long been collecting *Coleoptera*, &c., in Guatemala: he says that he is now located in the department of Chirique, adjoining Costa Rica; for the last four months he had been working the forest on the slope of the volcano of Chirique: he had already collected perhaps 1000 to 1500 species, by far the greater majority of which were identical with those of Guatemala: still he has taken many nice additions in *Coleoptera*—various *Cicindelidæ*, *Lebiidæ* (many species), *Lampyridæ*, *Lycidæ*, *Chrysomelidæ*, *Halticidæ*, *Hispidæ*, *Cassidæ*, *Longicornes*, *Lamellicornes*, *Brachelytra*, &c. Mr. Champion asked me to notify his change of address from Guatemala to David, Chirique, U. S. Colombia.—W. W. FOWLER, Lincoln: November 14th, 1881.

Phytosus balticus, &c., at Mablethorpe.—Last August I spent a short time at Mablethorpe on the Lincolnshire coast, and I found a few *Coleoptera* that are perhaps worth recording: perhaps *Phytosus balticus* in considerable numbers below high water mark is the best. *Phytosus spinifer* also occurred in the same locality, but not nearly as plentifully. I believe that the *Phytosi* have not before been recorded from Lincolnshire. On the sand-hills one of the commonest beetles was *Demetrius monostigma*, which I had never before taken. *Thyamis marcida* was fairly abundant, and *Psylliodes chrysocephala* very plentiful, the var. *nigricollis* being rather rare. I also took on the sand-hills *Taphria vivalis*, *Ceuthorhynchus asperifoliarum*, *Otiorhynchus muscorum*, *Meligethes viduatus* (kindly determined for me by M. Brisout), and other things. In a dyke I found *Hydroporus assimilis*, *Philhydrus testaceus*, *nigricans*, and *ovalis*, and many common water-beetles. The only Hemipterous insect I noticed was *Orthostira parvula* in some numbers in moss on the sand-hills.—ID.

Captures of Coleoptera in 1881.—The following notes on my captures during the past season may, perhaps, be of interest.

At Dulwich: *Dromius 4-signatus* (3), *Pterostichus picimanus* and *inæqualis*, *Bembidium obliquum* (on the banks of a small pond), *Aleochara lata*, *Tachinus scapularis* (3), *Ochina hederæ*, *Apion cruentatum*, *Phyllotreta ochripes* (the commonest of the genus), and *Psylliodes chrysocephala*, var. *nigricollis*, were, perhaps, the best.

West Wickham produced *Badister sodalis*; *Calathus piceus*; *Stenolophus teutonius*; *Hydroporus marginatus* (one specimen, found in the sweeping net!); *Mycetoporus lucidus*; *Staphylinus stercorarius* (three, in cow-dung); *Ocypus fuscatus* (three, beneath stones); *Antherophagus silaceus*; *Aphodius putridus*, *Zenkeri*, *porcus*, and *obliteratus*; *Opilus mollis*, *Hedobia imperialis*, *Salpingus castaneus* (common on pine), *Ceuthorhynchideus horridus*, *Cionus pulchellus*, *Tychius venustus*, *Otiorhynchus muscorum*, *Barynotus obscurus*, *Prasocuris aucta* (several at roots of trees, in February), and *Coccinella hieroglyphica* (a few, on heather), and *ocellata* (common on pine). *Aphodius porcus* was in the greatest profusion in one particular field. I took in all one hundred and sixty specimens, and might easily have captured double the number, had I felt inclined. By far the greater proportion of these were to be found within half an inch of the ground, in patches of horse-dung, the insect appearing to burrow beneath the droppings, and then tunnel upwards.

At Boxhill, during a hurried visit at the end of May, *Lema puncticollis*, *Lamprosoma concolor*, and *Cryptocephalus coryli*, turned up in the sweeping net.

From Belvedere, Kent, I obtained *Hylotrupes bajulus* (2) and *Donacia lemnae* in abundance.

A visit to Aylsham, Norfolk, for a fortnight in May, produced *Brychius elevatus*, *Liopterus ruficollis*, *Cercus bipustulatus* (plentiful), *Poophagus sisymbrii*, *Orchestes ilicis*, *Donacia dentipes* (common), and *Phyllotreta tetrastigma* (several).

Among some insects collected for me by a friend, was a fine female specimen of *Prionus coriarius*.—THEODORE WOOD, 5, Selwyn Terrace, Jasper Road, Upper Norwood, S.E.: November, 1881.

A note from Japan.—The extract I give below from a post-card recently received from Mr. Lewis is interesting anthropologically, as well as from a naturalist's point of view. That an Englishman should be successfully pursuing Natural History researches in the interior of Japan, and that he should be able to transmit thence information of his successes on a post-card in the course of eight weeks to Scotland, is a most striking illustration of the progress of civilization.—D. SHARP, Thornhill: October, 1881.

"CHIUZENJI: August 21st, 1881.—There is something curious even now in being able to send you a post-card from the forests of central Nipon, but here I am writing by the margin of a lake 4000 ft. above the sea, with mountains around it covered with vegetation, and rising another 4000 ft. at least. My last captures include a very nice *Miscodera*, and an *Atemeles*, very near *paradoxus*. The lake is 600 ft. deep, and has, in January, a belt of 20 ft. of ice; as you walk along the edge you displace the loose stones, and they fall into the water, and where your foot has been, wet stones are exposed: under these stones are water-beetles, quite secure from the small, but almost continuous waves of the lake. But neither species nor individuals are numerous, and a couple of hours' work does not produce many
* * *

Sericomyia borealis "singing" while at rest.—Last spring I inserted a note on the occurrence of *Sericomyia borealis*, Fall., in Sussex (Ent. Mo. Mag., April, 1881), and soon after received a letter from Mr. W. Grant Guthrie, of Hawick—he wrote as follows: "I venture to ask if you can give me any information as to the life-history of this insect; in particular if the strange singing noise emitted by the insect when at rest, and apparently motionless, is produced by the ♂ alone." I know nothing previously of this habit, and all I have been able to do is to corroborate Mr. Guthrie's statement, that the "strange singing noise" is made by the male.

When at Dallington this year (Aug. 18) I mentioned to my companion, Mr. H. F. Collett, this curious habit as described by Mr. Guthrie. He was fortunate enough almost immediately to take a specimen of this insect "making the singing noise when apparently at rest"—this proved to be a male. We saw no other example of the species. It therefore still remains doubtful whether the female also emits this sound, while I have ascertained nothing more of its life-history. Can any of your readers supply information on these points?

Since writing the above notice, I have heard from Mr. W. G. Guthrie, who has

kindly communicated the circumstances which first called his attention to the subject. I give an extract from his very interesting letter: "About the middle of August last year, while showing my collection of insects to Mr. Peach, of the Government Geological Survey, he gave me a humorous account of a fly which had amused his party while surveying in Yarrow. They had seen it mostly about the cairns on the tops of the hills. He imitated its singing, and described it as like a wasp, only twice the size. I was convinced it was something I had never seen before, and could only think of the hornet, though if it were to occur so far north it would scarcely make its appearance in such a situation. I felt interested, and determined to try and find it.

"Yarrow, the locality mentioned, was, however, at too great a distance (twenty or thirty miles) for me to reach; but I bethought me of a hill nearer at hand (fourteen miles) having something of the same physical features, with an altitude of 2000 feet, and covered with peat to the top. This hill I visited on the first opportunity, and had been on the summit only a few minutes, when I saw a fly alight on a stone, but it was so much smaller than I expected, that I did not at first pay much attention to it. I heard the singing too, but thought it came from a great distance.

"It was some time before I made out the connection between the fly and the sound; when I did so I got excited, made a dash with my net, and—missed! I waited a long while in hopes of another chance, but had to return home without the prize. The next Saturday I went back, and found the fly on exactly the same stone; afraid of losing it again, I did not give myself much time for observation, but captured it at once, thinking to pay more attention to the next, but never saw another. I am sorry to say that the weather this season has prevented me from making any further observations."

I may add, that Mr. Verrall very kindly determined the insect to which Mr. Guthrie refers, and concluded his note thus, "*The Sericomymia* is a ♂, probably the singing sex."—E. N. BLOOMFIELD, Guestling Rectory: November 11th, 1881.

[We shall be glad to know if this habit in *Sericomyia* has been previously recorded.—EDS.].

Capture of rare Hymenoptera on the south coast of England.—*Halictus quadricinctus*, Fab.—On the 3rd of September I captured four males and about a dozen females of this species on the Brighton Downs, near Falmer. Also a few of the latter only near Eastbourne. Mr. F. Smith, in his "*Bees of Great Britain*" (1855), and again in his second edition (1879), observes, that "Mr. Kirby, on the authority of Dr. Latham, quotes this bee as a species of the London district (1802), but no one has met with it since to my knowledge. Mr. Dale took the female in the Isle of Portland some years ago, with the exception of which, not a single specimen of either sex has been taken for many years."

Bombus soroensis, Fab.—I took two males of this species (corresponding with the *B. collinus*, Sm., *olim*) in widely distant localities near Brighton, on the 1st and 3rd of September; the first on field-flowers by the road side near Ovingdean, the second on *Rubus* near Falmer. Mr. Smith, in his first edition aforesaid, says, "The male of this species has been long known as the *Apis callumana* of Kirby, but the insect was very rarely seen in collections. During the month of August, 1854, I

met with *Bombus soroensis* for the first time at Southend, and obtained all the sexes in that locality. Having diligently collected during the last twenty years, without meeting with this species, it is probable that it is extremely local, and that its communities are small." But in his second edition, he concurs with Thomson (Hymenop. Scadin.) in giving the *B. callumanus* as a "distinct species," and in substituting the *B. collinus* of his first edition as the male of *B. soroensis*; while reiterating, in both instances, the reference to his former captures at Southend, and to other specimens obtained by Mr. Walcott from the Brighton Downs.

Colletes picistigma, Thoms.—Five specimens of the male of this species, new to the British fauna, were taken by me on chamomile flowers in August, along the undercliff near Chewton, Hants. I did not meet with any of the other sex.—SIDNEY SMITH SAUNDERS, Gatestone, Upper Norwood: November, 1881.

[The ♀ of this latter species has been taken in several localities by Mr. Bridgman and myself, and this capture of the ♂ is most interesting. I hope to describe both sexes in an early number.—E. S.]

Dufourea vulgaris, Schk., at Woking.—While walking along the banks of the Basingstoke Canal at Woking on the 1st of August last, I observed a number of small black *Apidæ* busy at work on the bloom of the Ragwort: to capture some few of them was the work of a very few minutes, and amongst them was one specimen which, when I picked it off the bloom, did not attempt to fly away but appeared very sluggish and lay in the palm of my hand as though feigning death, or as though benumbed with cold. Not knowing this insect I submitted it to Mr. E. Saunders, to whose kindness I am indebted for its determination; it is a ♀ and somewhat resembles a small *Panurgus calcaratus* in whose company it was taken; it is rare both on the continent and in this country. There is, I believe, only one other recorded capture of *Dufourea* in England, viz., by Sir S. S. Saunders (*vide* Ent. Mo. Mag., xvi, p. 181), in 1879, who took a solitary ♂ specimen by sweeping, near Christchurch, Hants; although I have looked carefully several times since in the same locality I have not been again able to meet with it.—T. R. BILLUPS, 4, Swiss Villas, Coplestone Road, Peckham: November, 1881.

Lasiosomus enervis, H.-Sch., near Weybridge.—A solitary specimen of this exceedingly rare Hemipteron was captured by myself at Weybridge, in March last, while shaking out moss over paper in search for the smaller *Brachelytra*; as I think this is the second specimen that is known to have been taken in this country, a record of its capture may not be unworthy a place in your Magazine. I am indebted to my friend Mr. E. Saunders, to whom I submitted the same, for his kindness in identification.—ID.

A few words on the larva of Cerura erminea as distinguished from that of C. vinula.—Having lately been asked to determine whether a *Cerura* was *vinula* or *erminea*, I had my attention drawn to the published figures and descriptions of the larva of the last named species, and finding some very contradictory statements as to its essential characters, I confess that for a time I was fairly puzzled.

In writing to Professor Zeller I mentioned my dilemma and called his attention to the figures given by Freyer in his *Beiträge* (I, 14) and in his *Neuere Beiträge* (I, 92), and to that given by Duponchel in his *Iconographie*. In reply the Professor says: "With regard to the larva of *Cerura erminea*, I can assure you that it is correctly represented by Freyer on both his Plates, but the earlier figure is almost better than the later one; the long white streak which runs down the side will distinguish it with certainty from the larva of *C. vinula*. I met with the larva in 1850 at Glogau, on Canadian Poplar, and bred a beautiful female the following March."

If the dark dorsal mark which we find both in the larva of *C. vinula* and in that of *C. erminea* be compared to a saddle, then the distinctive character of the latter larva is the *snowy white stirrup-leather* (with no stirrup attached) which depends from the saddle on the hinder half of the 8th segment descending below the level of the spiracle. If any one succeeds in finding a "Puss" larva with such a character, let him take great care of it, and if it does not produce an ichneumon, he may look in due course to see the imago of *Cerura erminea*.—H. T. STANTON, Mountsfield, Lewisham, November 14th, 1881.

Re-occurrence of Trochilium scoliiforme at Llangollen.—Not having seen any recent notice of the capture of *Trochilium scoliiforme* I thought that the record of a specimen taken this year might be interesting. Walking in a birch wood on June 26th, in the middle of the day, my attention was attracted by something running up the trunk of one of the trees, this proved to be a female *T. scoliiforme*, with wings unexpanded. A close examination discovered the empty pupa case protruding from the bark, and close to it another empty case. I diligently searched the trunks in the neighbourhood, and kept a sharp look out on the flowers but without further result. The birch wood close to Valle Crucis Abbey, Llangollen, is the precise locality mentioned by Stainton in his *British Moths*.—G. H. KENRICK, Maple Bank, Edgbaston: October 24th, 1881.

Agrotis Ashworthii at Penmaenmawr.—When collecting in North Wales, towards the end of July last, I found, high on a mountain at Penmaenmawr, two batches of eggs of some *Noctua*, but which I did not recognise. The smaller batch, deposited on the bare rock, I left, but the larger batch, deposited on a withered heath-twigs, I brought away. These soon hatched, and the larvæ fed well on *Polygonum* and other plants until about five-eighths of an inch long. But early in September, perhaps for want of suitable conditions for hibernation, they began to droop and die off rapidly, and, on the 19th of that month, fearing I should soon have none left, I sent about half-a-dozen to Mr. S. L. Mosley to figure for future reference, as I had been quite unable to make them out. Mr. Mosley, however, at once recognised them from figures or preserved larvæ in his possession, previously received from Mr. Gregson, as *Agrotis Ashworthii*; and, on looking up the descriptions, I found they were undoubtedly of that species. I had never thought of *Ashworthii* in connection with them, or should have recognised them long before. Some hundreds of them must have hatched, but at the time I write not more than one or two are alive, unless, indeed, friends to whom I gave some have been more fortunate. On the same mountain, I took a specimen of the fine dipterous, *Tabanus sudeticus*, of Zeller.—GEO. T. PORRITT, Highroyd House, Huddersfield: November 3rd, 1881.

*Occurrence of *Æcetis furva*, Ramb., in Cumberland.*—I took both sexes of the above insect at Elter-water, near Ambleside, in August.—JAMES J. KING, 207, Sauchiehall Street, Glasgow: November, 1881.

*New locality for *Polycentropus Kingi*, McLach.*—I was fortunate in capturing a few examples of the above caddis-fly on the Brathay river, near Ambleside, in August last. This is the third known locality for this insect.—ID.

Setodes argentipunctella, McLach, occurs in profusion on the Brathay river, at Brathay Church, Ambleside.—ID.

Stenophylax rotundipennis, Brauer, in Scotland.—When looking over some insects taken by Mr. Morton, at Carlisle, I found a ♂ and ♀ of the above, which he captured on the Clyde.—ID.

“*La Société Française d'Entomologie*” is the title under which certain members of the “*Société Entomologique de France*,” who think that respectable body has become somewhat effete, seek to establish a new Society; the prospectus and proposed rules bear the signature of Albert Fauvel. The principal aim is the publication of a French monthly Entomological Journal. We consider such a journal a distinct desideratum for France. But in that rich country surely there are to be found entomologists of sufficient enterprise to undertake the risk and trouble of such a publication without the aid of the ponderous machinery of a new Society; moreover, the present agitation throws the promoters open to the suspicion of wishing to create schism in the original Society. We wish to see the proposed journal appear, but not under the auspices of a second French Entomological Society. At the same time, we would hint that our colleagues of the executive of the “*Société Entomologique de France*” might show a little more energy, and institute some needful reforms, not the least of which should be an endeavour to bring out each annual volume of “*Annales*” within the year.—EDS.

The “Wiener entomologische Zeitung.”—We are glad to learn that the Austrian Entomologists propose to commence with the new year a monthly Entomological Journal (24-pp. 8vo, price 8 marks annually) under the above title. We wish it a longer life than its predecessor, the “*Wiener entomologische Monatschrift*.” The proposed editors are: Ludwig Ganglbauer (assistant in the Vienna Museum), Dr. Franz Löw, Prof. Josef Mik, Edmund Reitter (all three well-known names), and Fritz Wachtl (“*Oberförster*” and official entomological referee). It will be published by Alfred Hölder, of 15, Rothenthurm Strasse, Vienna.—EDS.

Obituary.

William Garneys.—The brief record of Mr. Garneys's sudden death (at the early age of 49), contained in our last Number, needs supplementing by a few remarks on his devotion to the study of Entomology, and a reference to a local work of somewhat high standing, of which he edited the 2nd edition. Educated for the medical profession, and the son of a country doctor, there is small wonder that the practical pursuit of an easily accessible branch of natural history should have attracted him as a young man, whose mind was well prepared by anatomical and biological studies: and no better field for observation could have been found than

the district around Bungay, on the river Waveney, the boundary line of Suffolk and Norfolk, in which town his early days were spent. The marsh lands and rich pastures here produce insect life in profusion, both of species and individuals; and probably no single locality in England would offer so many attractions to an incipient Entomologist. During his final curriculum in the metropolis, Mr. Garney made the acquaintance of the chief London Coleopterists; and when he settled at Repton, on the Trent, in South Derbyshire, he never allowed the anxieties and ceaseless duties of a country doctor in considerable practice to prevent him from seizing every opportunity of extending his knowledge of the local insect fauna. Here he was fortunate in meeting with others of congenial tastes, Burton and its neighbourhood having, by some lucky chance, attracted enough resident Entomologists to form, as it were, a local Society, containing such names as Brown, Hewgill, Garneys, Harris, Mason, and Fowler, all well-known supporters of British Entomology.

Mr. Garneys was unwearying in his efforts to assist his fellow workers; with an accurate eye, well trained by lengthened scientific observation, and possessed of sound books and a good collection, he was never so happy as when working out the difficulties captured by himself or his friends; and the chief result of this close attention is shown by his "List of Coleoptera of Repton and neighbourhood," contained in the 2nd edition, edited by him, of the "Contributions to the Flora and Fauna of Repton and neighbourhood," published by Bemrose & Sons, 23, Old Bailey and Irongate, Derby. This little volume was originally compiled for the guidance of the students of Natural History in the well-known Repton School; it contains—Lists of the Plants by Mr. F. O. Bower and Mr. Lewis, twice revised and added to by Mr. Garneys; of Birds by Mr. Worthington; of Mosses and *Mollusca* by Mr. Garneys and Mr. Hagger; of *Lepidoptera*, originally by the Rev. F. Spilsbury, but increased by Mr. Garneys and Mr. Mason; and of the Beetles by Mr. Garneys alone. This latter is very full, with localities, &c., and may be taken as a model for local lists. It is remarkably free from misprints, and we are only able to add a single species to it, viz., *Phyllotreta tetrastigma*, Comolli, which the writer of this notice found in Repton Shrubs when collecting with the late Mr. Garneys.

Mr. Garneys was a supporter of this Magazine from the very first, and occasionally contributed short notes to our columns.

John Bickerton Blackburn, B.A., died at the residence of his father-in-law, the Rev. J. Buckmaster (Vicar of Wandsworth) on the 29th October, at the early age of 36. He was the brother of the Rev. Thomas Blackburn (now of Honolulu Hawaiian Islands), one of the original editors (we might say the founder) of this Magazine. After the demise of the "Entomologist's Weekly Intelligencer" in 1861, the two brothers and a friend (all youths) started, in August, 1862, the "Weekly Entomologist," and continued it for 15 months, a bold stroke, and one that might have been successful had the experience of the editors been equal to their enthusiasm. Both brothers at that time held official positions at Somerset House: both found the position uncongenial. Our former colleague qualified himself for clerical duties: his brother (now deceased) became engaged in tuition, but his health gave way, resulting in his death after a long illness. He paid special attention to British *Lepidoptera*, and worked hard both at collecting and rearing.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

VI. HYMENOPTERA ACULEATA,

COLLECTED BY THE REV. A. E. EATON IN 1880.

BY EDWARD SAUNDERS, F.L.S.

In recording the species of Aculeate *Hymenoptera* captured by the Rev. A. E. Eaton, I am glad to be able to notice many species of considerable rarity and interest, including 4 that I believe are new to science, and which I have described in the following notes. The collection contains altogether 79 species, and of these 28 occur also in Great Britain. Dr. Perez, of Bordeaux, has kindly examined some of the difficult species of *Andrena*, &c., for me, and many of them bear his names, some of which, I believe, are still unpublished, but likely to appear in a forthcoming work.

FOSSORES.

Mutilla stridula, Rossi.—One ♀, May 8th, at Almodovar.

Philanthus triangulum, F.—One ♂, May 23rd, on the hillside near São Marcos de Serra.

Cerceris arenaria, L.—One ♂, May 15th, in a vineyard to the north of Silves.

Hoplisis latifrons, Spin.—One ♀, May 15th, in a vineyard to the north of Silves.

Bembex rostrata, F.—Three ♂, July 7th, Vigo [Spain], off *Eryngium* on the sea shore.

Trypoxylon clavicerum, Lep.—One ♀, May 18th, on the road from Silves to Monchique.

DIPLOPTERA.

Vespa germanica, F.—Two ♀; one on Picota, near Monchique, the other at Cintra.

V. sylvestris, Scop.—Two ♀; one, June 24th, westward of Villa Real, the other, June 14th, hillside near Ponte de Morcellos. Both specimens are more shining than those that occur in England.

Odynerus (Oplopus) Dufourii.—Two ♀, May 7th, near Almodovar.

O. (Leionotus) simplex, F.—One ♂, May 13th, between São Barnabe and São Bartholomeu do Messines. The yellow colour in this specimen is unusually abundant.

O. — *sp.* ?.—One ♂ allied to *tristis*, Thoms., June 12th, Ponte de Morcellos.

O. (Ancistrocerus) renimacula, Lep.—One ♀, June 14th, hillside near Ponte de Morcellos.

Pterochilus phaleratus, Pz.—One ♂, June 15th, without locality.

Ceramius lusitanicus, Klüg.—One ♀, May 19th, near Monchique.

ANTHOPHILA.

Colletes marginata, Sm. (*nec* Schenck).—One ♂, June 3rd, between Coimbra and São Antonio.

Sphecodes gibbus, L.—One ♀, June 8th, Cea.

S. pilifrons, Thoms.—One ♀, May 15th, vineyard north of Silves.

Halictus scabiosæ, Rossi.—Four ♀, June 3rd, between Coimbra and São Antonio.

H. pyrenæus, Perez.—Two ♀, June 3rd, between Coimbra and São Antonio.

H. cylindricus, F.—One ♂.

H. hæmorrhoidalis, Schk, 1853. } —One ♂, two ♀. ♂ & ♀, June
prasinus, Sm., 1855. }

12th, Ponte de Morcellos; ♀, May 15th, vineyard north of Silves. Prof. Perez has examined the ♂, and returned it with the note, "*H. hæmorrhoidalis*, Schenck, = probablement le ♂ de *prasinus*," and it agrees with the ♂, which we refer to that species in this country. Schenck's name has the precedence.

H. interruptus, Panz.—One ♀, June 24th, westward of Villa Real.

H. bifasciatus, Brullé.—One ♀, slopes of Picota near Monchique, at an altitude of over 1600 feet.

H. —*sp.*?, "4-signato affinis" Perez.—June 14th, hillside near Ponte de Morcellos.

H. platycestus, Dours.—One ♀, May 15th, vineyard north of Silves.

H. costulatus, Kriech.—One ♀, May 21st, near Monchique, at an elevation of 1650 feet.

Andrena pilipes, Fab.—One ♂, near Monchique, with the preceding.

A. Trimmerana, Kirb., *var. spinigera*, K.—One ♂, April 27th, hill above Cintra, near the Peña. Prof. Perez considers *spinigera* as only a form of *Trimmerana*, and I have little doubt that he is correct, the male of *spinigera* true is very distinct, by the long spine on the cheek, but this spine varies very much in length, according to the individual, and the females are, as far as I can make out, undistinguishable.

ble, except by the colour of the abdomen, which in the other allied species, such as *rosæ*, *decorata*, &c., is known to be very variable and of no specific value.

A. nigroænea, Kirb.—Two ♂ ; one, June 3rd, between Coimbra and São Antonio ; the other, April 27th, above Cintra, near the Peña.

A. granulosa, Perez.—One ♀, May 20th, slopes of Picota, near Monchique, at an elevation of about 1700 feet.

A. fulvago, Kirb.—One ♀, May 13th, between São Barnabe and São Bartholomeu do Messines.

A. distincta, Luc.—One ♀, May 19th, near Monchique.

A. lithurgoides, Perez.—One ♀, April 27th, hill above Cintra, near the Peña. This species, Prof. Perez says, is rare, and he points out that the specimen is disfigured by stylopization, having the villosity of the last segments denser than in the typical form, and more or less rufescent, also that it has some white spots on the clypeus, which do not exist in the type.

A. Pandellei, Perez, ♂ ?.—One ♂, June 3rd, between Coimbra and São Antonio. Prof. Perez says that he only knows the ♀ of *Pandellei*, which has the thorax covered with a scale-like pubescence like *squamea*, Gir., *squamigera*, Schk., &c., and has the first two abdominal segments red ; in this ♂ they are black.

A. fulvicrus, Kirb.—One ♂, April 27th, on the hill above Cintra : one ♀, June 3rd, between Coimbra and São Antonio.

A. lucens, Imh.—One ♂, April 27th, hill above Cintra, near the Peña.

A. obsoleta, Perez.—One ♀, May 7th, Almodovar.

A. puncticollis, Perez.—One ♀, May 18th, on the road from Silves to Monchique.

A. Afzeliella, Kirb., var.—One ♀, June 3rd, between Coimbra and São Antonio.

A. erythronota, Perez.—One ♀, June 12th, Ponte de Morcellos.

Dasyroda cingulata, Erichs. (Waltl, Reise).—Four ♂, June 3rd, between Coimbra and São Antonio. These ♂ agree well with Erichson's description, except that the 2—5 abdominal segments are clothed with black hairs at the base, which are not mentioned by him, but they are in very good condition, and if Erichson described from a ♂ that had been more exposed to the sun, &c., the difference might easily be accounted for.

Dasypoda Eatoni, n. sp.

Nigra, sub-nitida, capite (vertice excepto nigro), thorace, abdominisque segmentis duobus basalibus, pilis erectis late fulvis dense vestitis, reliquis nigro pilosis, tertio apice fulvo; segmentorum ventralium apicibus dense nigro-fimbriatis; pedibus supra fulvo, subtus nigro pilosis; tarsis calcaribusque testaceis; metatarsis infuscatis. Antennis omnino nigris.

Caput vertice subnudo, irregulariter punctato; mesothorax nitidus crebre sed minute punctatus, metathorax punctatus areâ basali triangulari rugulosâ; alæ subfuscæ, venis fusco-nigris; abdomen nitidum, rugose punctatum, segmento septimo anguste rotundato, sexto ventrali apice rotundato in medio anguste emarginato, postice pilis brevibus erectis densissime vestito; tibiis metatarsisque longe pilosis.

Long. 13 mm.

One ♂, June 24th, westward of Villa Real, at an elevation of 1780 feet. I can find no description that will at all agree with the characters of this ♂, which is in very bright and fresh condition.

Panurgus proximus, n. sp.

♂. *P. Banksiano*, K. (atro, Pz.), *simillimus, sed genitalium formâ coloreque obscuro mox distinctus (vide fig.).* *P. arctos*, Erich., *affinis, sed fimbriæ anali colore discedens, ♀ quam ad hanc speciem refero.* *P. Banksiano formâ approximât sed fimbriâ anali late aureâ, abdominisque segmento sexto dorso subplano, distinguitur.*

Long. 10—12 mm.

Fig. A. Genitalia of *P. proximus*.

„ B. Apex of sagittæ of genitalia of *P. Banksianus*.

♂ ♀, May 12th, between Almodovar and São Barnabé; ♀, May 15th, vineyard N. of Silves.

I have not described this species in full, as it is so like *P. Banksianus* that I thought it would be enough to indicate its characteristic peculiarities. In the ♂ the genitalia are dark brown, not pale testaceous as in *P. Banksianus* (in this respect agreeing with *P. arctos*, Er.); the sagittæ are produced laterally into a membranous wing, wholly wanting in *P. Banksianus*, and the apex of each is not rounded as in that species. The ♀ is distinct not only by the bright colour of the anal fringe, but also by the nearly simple apical segment, which in *P. Banksianus* has its centre triangularly raised.

I have had very great doubts as to the distinctness of this ♂ from *P. arctos*, but Erichson mentions both *ater* and *arctos*, and distinguishes *arctos* from *ater* by the darker colour of its genitalia and its *black* anal fringe. Now, in my specimen the anal fringe is if anything lighter than in *ater*, and I therefore, thought that I should not be justified in adopting his name. I have no actual proof that the ♀ described belongs to this ♂, but they were taken in the same locality and on the same day.

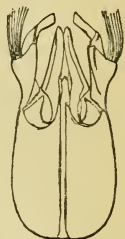
P. calcaratus, Scop.—Two ♂, Almodovar, May 10th, and São Romão, June 9th, the latter at an elevation of 1790 feet.



P. Perezi, n. sp.

Niger, nitidus, nigro pilosus, capite maximo, thoracis multo latiore, facie (vide fig.) transversâ pilosâ, clypeo pilosissimo, antice valde et semi-circulariter exciso, labro polito, mandibulis falcatis, genis pilosis, vertice polito, subquadrato, postice emarginato sparsim punctato et piloso; thorace supra breviter, sub alis longe, pilosa; mesothorace supra nitido, sparsim punctato, linea dorsali antice impresso, alis dilute infuscatis; metathorace basi longitudinaliter rugoso; abdomine subovali sparsim nigro piloso, segmentorum apicibus sub-depressis, discoloratis, fimbria anali nigra, subtus, præsertim lateribus, nigro piloso; genitalibus pallide testaceis, nitidis, stipitibus medio externe longe nigro fasciculatis (vide fig.), pedibus simplicibus rufo-pilosis, tarsorum apicibus testaceis, metatarsis anterioribus subtus longe pilosis.

Long. 10 mm.

Head of *P. Perezi*.Genitalia, *P. Perezi*

P. cephaloti affinis, coxis simplicibus, tibiisque intus non fasciculatis distinctus.

Three ♂, May 15th, in vineyard north of Silves.

This species appears to me quite distinct from anything described. I sent a specimen to Prof. Perez, who told me it was unknown to him.

Panurginus montanus, Gir.—One ♀, May 15th; this rare little species was taken in a vineyard north of Silves.

Camptopæum frontale, Fab.—One ♂, June 9th, São Romão, at an elevation of over 1790 feet; this is also a rare species in collections.

Osmia rufa, L.—One ♀, hillside near São Marcos de Serra.

O. cærulescens, Latr. and Giraud (*nec* Kirby).—One ♂, one ♀. Giraud, in his paper on the *Hymenoptera* which infest the brier-stems (Ann. Soc. Ent. Fr., 4, ser. vi) has carefully distinguished two very distinct species, which are mixed in many collections under the name of either *ænea* or *cærulescens*, but he refers to *cærulescens*, Kirby, the species whose ♂ has the apex of the abdomen 3-dentate and the ♀ the thorax black; certainly, Kirby in his description says *corpore femineo atro*, but we have only found one species in England, and that certainly is the one with the 2-dentate ♂ and the blue-black ♀. I say this after a careful examination of Kirby's types.

O. fulviventris, Latr.—One ♀, June 3rd, between Coimbra and São Antonio.

O. adunca, Panz.—One ♂, May 18th, road from Silves to Monchique.

Megachile maritima, Kirb.—One ♂, July 7th, Vigo [Spain], amongst *Eryngium* on the shore.

M. melanura, Duf.—One ♀, May 7th, Almodovar.

Heriades campanularum, Kirb.—One ♂, June 3rd, between Coimbra and São Antonio.

Ceratina albilabris, Jur.—Four ♂, four ♀, May 21st, near Monchique, at an elevation of 2050 feet; 21st June, up the high hill N.W. of Villa Real.

Nomada succincta, Panz.—Three ♀; two taken, May 13th, between Barnabe and São Bartholomeu do Messines, and one, June 12th, at Ponte de Morcellos. The two taken on May 13th are very large and fine, and I was almost tempted to describe them as a new species, but as I can find no satisfactory structural characters, I think it wiser to wait for further evidence of their distinctness.

N. — *sp.*? not yet determined.—One ♂, May 20th, slopes of Picota, near Monchique, at an elevation of 2250 feet.

N. — *sp.*?—One ♀, = ? ♀ of preceding, June 12th, Ponte de Morcellos.

N. — *sp.*?—One ♂, May 20th, slopes of Picota, near Monchique, at an elevation of 2250 feet.

Dioxys pyrenaica, Lep —One ♂, May 7th, Almodovar.

Crocisa orbata, Lep.—Two ♂, June 14th, hillside near Ponte de Morcellos.

Melecta punctata, Latr.—One ♀, hillside near Ponte de Morcellos.

Eucera subrufa, Lep.—One ♂, June 3rd, between Coimbra and São Antonio.

E. similis, Lep.—One ♀, June 19th, near Monchique.

E. nigrofacies, Lep.—One ♂, June 3rd, between Coimbra and São Antonio.

E. semistrigosa, Dours.—One ♀, June 3rd, between Coimbra and São Antonio.

E. collaris, Dours.—One ♀, April 25th, quarries and hillsides near Belem.

E. hispanica, Lep.—One ♀, June 12th, Ponte de Morcellos.

Tetralonia — *sp.*?—One very rubbed ♂, May 23rd, hillside near São Marcos de Serra.

Saropoda bimaculata, Panz.—Two ♂, June 9th, near São Romão, and, June 24th, westward of Villa Real, both at an altitude of 1780 feet or more.

Anthophora personata, Illig.—Two ♂, April 24th, near Olivaes.

A. pennata, Lep.—Two ♂, one ♀; ♂ & ♀, April 28th, on the road to Mafra; ♂ much faded, May 19th, near Monchique.

A. femorata, Latr.—One ♂, June 24th, west of Villa Real, at an elevation of 1780 feet.

A. Thomsoni, n. sp.

Nigra, capite toto nigro cinereo, hirsuto, clypeo rugoso-punctato; thorace creberrime punctato, cinereo hirsuto, dorso summo laevi, inter alas nigro fasciato; alis dilute infuscatis; scutello linea dorsali elevata; abdomine crebre punctato, segmento primo longe cinereo hirsuto, 2^{do} 3^{io} que apicibus albo-fimbriatis, 5^{to} dense nigro piloso; 6^{to} valvula dorsali angusta, sub-convexa; subtus nitida, punctata, segmentorum apicibus membranaceis, nigro fimbriatis, segmento 4^{to} lateribus albo fasciculatis, 5^{to} apice dense nigro piloso, 6^{to} setis rigidis fuscis terminato; pedibus nigro hirsutis, tibiis tarsisque antice griseis; sarothro albo, metatarsis posticis dense nigro pilosis.

Long. 14 mm.

One ♀, June 9th, near São Romão, at an elevation of 1792 feet. Somewhat like *atroalba*, but differing at once in the colour of the metatarsi, and the narrow white apical bands on the 2nd and 3rd abdominal segments. I have named this species in honour of Dr. C. G. Thomson, of Lund.

Xylocopa violacea, Scop.—One ♂, May 20th, slopes of Picota, near Monchique.

Bombus hortorum, Linn.—Two ♂, one ♀, near Belem, N.W. of Villa Real, and between Coimbra and São Antonio.

B. terrestris, Linn., var.—One ♀, May 20th, slopes of Picota, near Monchique. The hairs on the legs are bright fulvous, agreeing with the variety mentioned by F. Smith in Brit. Mus. Catalogue, *Apidæ*, part ii, p. 391.

B. muscorum, Linn.—One ♂, two ♀, June 3rd, between Coimbra and São Antonio; June 6th, Cea.

Apis mellifica, Linn.—April 27th, quarries and hillside near Belem.

Holmesdale, Upper Tooting :

November, 1881.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

*(continued from page 126.)*8. *DRYMEIA*, Meig.

Gen. ch.—Eyes bare, sub-contiguous in males; antennæ short, with sub-plumose arista; peristome and cheeks bristly; proboscis elongate, horny, and with a moveable, pointed, hook-like apex; abdomen oblong and hairy; alulets moderately developed, with unequal scales; wings with anal vein not prolonged to the margin; legs spinous.

D. HAMATA, Fall.*obscura*, Meig. and Macq.

Of this peculiar genus with its elongated hooked proboscis, only one European species is known. I am not aware whether any exotic species have been described, but in a collection of North American *Anthomyiidæ*, which I received in 1876 from the Museum of Natural History, in Cambridge, Mass., for inspection, through the kindness of Baron R. Osten-Sacken, I found several specimens of a species closely related to *D. hamata*, but rather smaller.

9. *POGONOMYIA*, Rond.

Gen. ch.—Eyes bare, sub-contiguous in males; antennæ short, second joint armed with long bristles; arista sub-pubescent; peristome thickly bearded with bristles; proboscis of ordinary form; abdomen oblong, and hairy in the males, especially at the apex; alulets of moderate size, with unequal scales; wings with anal vein not reaching the margin; legs bristly.

P. ALPICOLA, Rond.

Rondani formed this genus for a single alpine species, which bears a strong general resemblance to *Drymeia hamata*, but differs essentially from that fly by the absence of the hooked proboscis. *P. alpicola* is shining black, about 3 lines in length, with fuscous wings, black poisers, hairy body and legs. Rondani only knew the male; the female differs from it in having the eyes separated by a frontal space, occupying nearly a third of the width of the head; this space is of a deep velvety black colour, bordered on each side by a narrow whitish margin, in which is seated a single row of strong bristles, extending to the base of the antennæ. The ocelli are seated on an oval spot, the front part of which glistens with silvery-white reflections; there is also a well-marked, triangular, silvery-white spot between and over the bases of the antennæ (this spot also exists in the male, though of a smaller size). The peristome is nearly smooth, and the body and legs less hairy than in the male. The abdomen is conical and pointed at the apex. The colour is shining black, with cinereous reflections. The poisers are black, and the wings fuscous, but less deeply coloured than in the male, especially at their bases.

Like *Drymeia hamata*, *P. alpicola* is sluggish in its habits; it has not previously been recorded as British, nor mentioned I believe by any continental author except Rondani. At the end of June and in the beginning of July last (1881), I found both males and females in profusion in a field of mowing grass, on very high ground, at Queensbury, between Bradford and Halifax. The flies were all located in the corollæ of buttercups (*Ranunculus acris*), and allowed themselves to be captured by the hand. I have not met with them in, nor received them from, any other locality.

10. OPHYRA, Desv.

Gen. ch.—Eyes bare, large, contiguous or sub-contiguous in males; arista bare; abdomen oval, furnished with soft hairs, but without bristles; alulets large, lower scale much longer than upper; anal vein of wings not reaching the margin; posterior tibiæ mostly curved and ciliated; colour metallic steel-blue or black.

1. LEUCOSTOMA, Fall. 2. ANTHRAX, Meig.

The flies comprised in this small genus are characterized by their shining metallic colour. In their habit they resemble some of the true *Muscidæ*, as the *Luciliæ*, &c. The first species is generally distributed; but the second (*O. anthrax*) is local, though occurring in great abundance in some places. The only locality in which I have seen it was at Buckingham, where it was swarming on a hedge near a bone mill, which emitted a strong putrid smell.

11. TRICHOPHTHICUS, Rond.

Lasiops, Meig. p.

Gen. ch.—Eyes hairy, and contiguous or sub-contiguous in males; arista sub-pubescent or bare; epistome sometimes prominent; alulets moderately developed, with unequal scales; anal vein not prolonged to the margin of wing.

- | | | |
|-----------------------|--|--------------------------|
| 1. CUNCTANS, Meig. ♂. | \| | 2. SEMIPELLUCIDUS, Zett. |
| innocens?, Zett. ♂. | | 3. PULCHER, sp. n. |
| decolor, Fall. ♀. | | 4. ROSTRATUS, sp. n. |

Meigen formed the genus *Lasiops* to include all those species of *Anthomyiidae* which have hairy eyes and a pubescent arista. His definition was so short and incomplete, that he grouped together several species belonging to quite distinct genera; and the genus *Lasiops*, as described in the 7th vol. of his great work, really includes only two characteristic species, for out of the five which he enumerates, one (*L. occulta*) is a *Hydrotæa*, another (*L. apicalis*) appears to be identical with *Hyetodesia semicinerea*, Wdm., and a third (*L. ænescens*) belongs to the genus *Lonchæa* among the *Acalypterata*.

Besides *L. cunctans*, Meig., and *L. hirticeps*, Fall. (the two species

left in Meigen's genus), there are several species which have been since discovered, with hairy eyes and bare aristæ, which cannot be placed in any of the other described genera; some of these are more highly developed than the others, having largish alulets with unequal sized scales, while some are of feeble organization, with small and equal sized scales. Rondani has placed the former group in his genus *Trichophthicus*, and reserved the name of *Lasiops* for the latter. This arrangement ought to be reversed, as Meigen's typical species (*T. cunctans*) should be retained in his own genus; but my friend, Herr Kowarz, having lately published* an elaborate monograph on the species in the latter division, in which he has followed Rondani, I feel bound to do the same. I shall return to the restricted genus *Lasiops* when I have finished with the more highly organized genera.

T. CUNCTANS, Meig.

This species, which is not uncommon in the North of England, appears to be very rare on the continent. Meigen imperfectly describes the male only, and mentions no habitat. Schiner gives a brief but correct description, stating that he had only seen a single male; and Macquart and Rondani do not allude to it. As I have found both males and females in the neighbourhood of Bradford, I will shortly mention the chief peculiarities of each; for though it is a very well-marked species, it is very imperfectly known.

The males have the eyes contiguous, and clothed with long hairs; the thorax is shining black, but in a strong light may be seen to be striped with four indistinct deeper black lines, the outer of which are broken at the transverse suture. The abdomen is clothed with soft hairs, and appears of a blackish colour when viewed from before backwards, but when looked at from the opposite direction, shines with whitish-grey reflections, and shows a widish, tapering, black dorsal stripe, with indistinct black posterior borders to each segment. The scales are yellowish, and the poisers black. The wings are slightly fuscous; the third and fourth longitudinal veins are parallel between the external transverse vein and the apex, the external transverse vein itself being obliquely placed, but straight. The legs are all black and clothed with soft hairs, but few spines; the posterior tibiæ are ciliated with fine bristles, of moderate and even lengths, along the whole of their external surfaces.

The female has the eyes widely separated, and only slightly pubescent. The thorax and abdomen are both of a dull grey colour, the former is distinctly striped with four black lines, the two central ones extend from the anterior edge to the centre of the back, a little over the suture; the lateral ones are interrupted at the transverse suture, the portions in front of which assume the shape of an oval black spot, while the hinder portions are prolonged in straight lines to the hinder part of the thorax. The abdomen is of a flattened oval shape, pointed at the apex, and of an uniform grey colour. The poisers are black, as in the males, the scales nearly

* Die Diptere ngattung *Lasiops*, Mg. ap. Rd., Mittheil. d. münchener Ent. Ver., 1880, p. 123.

white; the wings clear, and the legs as in the male, but less hairy. There is no doubt but that the *Musca decolor* of Fallén, also described by Meigen and Zetterstedt by that name, all of whom only knew the female, is the opposite sex of *T. cunctans*, though neither of the first two authors were aware of it. Zetterstedt* suspected that his *A. innocens* might be the same as Meigen's *cunctans*, and adds that perhaps it is the male of *A. decolor*. The description of his *A. innocens*, however, does not apply to *T. cunctans* in some points.

T. SEMIPELLUCIDA, Zett.

This very well marked species has been confounded with Meigen's *Lasiops apicalis*, which there is no doubt is the same as *Hyetodesia semicinerea*, Wdm. *T. semipellucida* also bears a very strong general resemblance to that species, and they are often mixed up in collections; but they may easily be distinguished by the following characters: in *H. semicinerea* the arista is decidedly sub-plumose both in male and female, while in *T. semipellucida* it is almost bare in both sexes; in *H. semicinerea* the thorax of the male is more glabrous, and there is a patch of white reflections on each shoulder, which is absent in the other species; the wings of the males are only slightly darkened along the anterior margins in *H. semicinerea*, while they are quite fuscous in *T. semipellucida*; the abdomen is of a pale transparent yellow colour in *H. semicinerea*, with the apical segment black, together with a black dorsal central stripe, and black posterior margins to the segments, while in *T. semipellucida* the abdomen is of a dull brownish-yellow colour, darker towards the hinder part, with transverse black stripes, but without the central dorsal stripe or the black apex; the legs of the males are decidedly longer in *H. semicinerea* than in *T. semipellucida*, and the posterior tibiae are ciliated on both sides with long hairs in the former, but are almost bare in the latter.

This little fly is generally distributed, but not very common.

T. PULCHER, sp. n.

Mas, niger, nitidus; oculis tenuiter hirtis; abdomine oblongo-ovato, cinereo, albo-micante, sub-striato; alis subfuscis; halteribus flavidis; pedibus simplicibus.

Femina, obscure cinerea; oculis sub-nudis; thorace abdomineque concoloribus innotatis; alis hyalinis.

Long. 1½ and 2 lin.

♂. *Head*: eyes sub-contiguous, with short hairs; forehead and face not prominent, epistome slightly projecting; antennæ a little prolonged, the third joint about twice as long as the second; arista long, thickened, and slightly pubescent at the base, the remainder slender and bare.

Thorax with *Scutellum* shining brownish-black, and unstriped.

Abdomen hairy, oblong-oval or conical, of a brownish-grey colour when viewed from before backwards, but when seen in the opposite direction, appearing of a glistening whitish- or bluish-grey colour (glaucous), marked with faint brown dorsal reflections, assuming the form of a dorsal stripe, dilating into indistinct triangular spots or patches; sub-anal organs small.

Wings more or less tinged with brown; third and fourth longitudinal veins slightly diverging at their extremities; external transverse vein straight and upright.

* Dipt. Scand., vol. iv, p. 1523.

Calyptra yellowish-white, rather small, but with unequal scales. *Halteres* yellow.

Legs black, with few hairs or bristles; posterior femora rather long, almost bare along their anterior two-thirds, but furnished with a loose tuft of a few long hairs on both sides of their hinder extremities; posterior tibiæ bare, with the exception of two or three shortish bristles on their outer sides.

♀ rather smaller than ♂. *Head*: eyes nearly bare, separated by a wide black space, occupying nearly a third of the width of the head. *Thorax* and *Abdomen* of a brownish-grey colour, without markings. *Wings* clear. Other characters similar to those of the male.

This small species is generally distributed, especially in the North of England; it bears a good deal of resemblance in size, shape and colour to *Mydæa vespertina*.

T. ROSTRATUS, sp. n.

Mas, nigrescens; ore valde producto; abdomine glauco-cinereo, linea dorsali et faciei transversis nigris signato; tibiis posticis incurvis, apicibusque calcare acuto armatis; halteribus nigris. Long. 3 lin.

Head: eyes long-haired, and contiguous; forehead prominent; face white, with black reflections; antennæ black and short, the third joint rather longer than the second; arista sub-pubescent; lower surface of head flat, with the anterior part projecting forward below and beyond the antennæ in the form of a snout; opening of the mouth large; proboscis thick and rather elongated; palpi filiform and black.

Thorax black, clothed with thin grey tomentum, and without distinct stripes; shoulders greyish-white; scutellum black.

Abdomen hairy, conical, and rather elongated; the four segments nearly equal in length, the first black, the other three of a glaucous or greyish-white colour, with black reflections, which show differently in different aspects; when viewed from before or the side, they assume the form of six semi-lunar spots, one placed on each side of the base of each segment; but when seen from behind, there appears to be an interrupted central dorsal stripe, dilated at the posterior edge of each segment into a triangular spot, the lower angles of the base of which are continued into a transverse, widish black band, which encircles the posterior margin of each of the three last segments; anal segment thickened, but without projecting appendages.

Calyptra well developed, white. *Halteres* black.

Wings clear, third and fourth longitudinal veins divergent; internal and external transverse veins near together, the latter straight.

Legs black, with posterior femora ciliated along their whole under-surfaces with hairs of moderate and even lengths; posterior tibiæ curved inwards, shortly ciliated along their outer sides, and armed with a strong sharp pointed spur a little before their apex on their inner sides, which are otherwise nearly smooth.

The female is unknown to me.

I have seen but one specimen of this well-marked and peculiar species, which was in an imperfect condition, having lost the anterior tibiæ and tarsi, and the middle legs entirely; it was in a collection of unnamed British *Diptera* made by the late Mr. Francis Walker, the locality being unmarked. It is closely related to the *A. subrostrata* of Zetterstedt, but differs essentially by having the posterior tibiæ spurred.

(To be continued).

NOTES ON BRITISH *PTEROPHORIDÆ*.

BY C. G. BARRETT.

For a long time it has seemed to me that the present synonymy of the *Pterophoridæ* is not well understood, nor, fully cleared up. The corrections introduced by Dr. Jordan in his notice of Pastor Wallengren's work (Ent. Mo. Mag., vol. vi, pp. 117 and 149), and by Mr. Stainton (Ent. Mo. Mag., vol. ii, p. 137), have been partially adopted, and the names introduced in an extremely haphazard manner into published lists and private collections; and, as I have a few words to say on some of the species recently noticed by my friends Dr. Jordan and Mr. Sang, in these pages, the opportunity seems favourable for suggestions about the nomenclature of others.

Platyptila Bertrami, Rössl. (= *ochrodactyla*, Hüb., *dichrodactyla*, Mühlig.).—It ought not to be necessary to point out that these are not three species, but that the name *ochrodactyla* was found to belong properly to the species which feeds on tansy (*Tanacetum vulgare*), and not to our much commoner species on *Achillea*, which, therefore, received another name—*Bertrami*, Rössl. The third name—*dichrodactyla*, Mühlig,—being a synonym of *ochrodactyla*, need not be used. In this we shall be in agreement with continental authorities.

In contrast to the habit of the larva of *ochrodactyla*, as detailed by Mr. Sang, I may mention that the larva of *Bertrami*, which feeds (exclusively, I think) on *Achillea millefolium* and *ptarmica*, attacks the top of a young shoot, eating out the heart and feeding downwards for a short distance into the tender young stem, then leaves it to attack another young shoot in the same manner. This larva is, in fact, rather an external, than an internal, feeder. The habits of the larvæ seem certainly to point to the distinctness of these two species.

For *Platyptila trigonodactyla*, Haw., the prior name, *gonodactyla*, Schiff, is, I think, now generally adopted, but the correction of *cosmodactyla*, Hüb., for *Amblyptilia punctidactyla*, Haw., seems usually to be ignored.

Oxyptilus parvidactylus, Haw., is mentioned by Dr. Jordan in the paper above referred to (Ent. Mo. Mag., vol. vi, p. 122) as *Oxyptilus obscurus*, Z., the name adopted by Wallengren, but Haworth's name has priority, and should be retained.

Oxyptilus hieracii, Z.—I feel no doubt that this species is truly British, although very rarely obtained. I have two specimens of the nativity of which I have no doubt, though I cannot ascertain the locality in which they were captured. They were sent to me by a

friend who does not collect the group, and could not recollect whence they came. There were authentic specimens in the collection of the late Mr. T. H. Allis, and I hope they still exist at York.

Oxyptilus lætus, Z., *distans*, Z.—To a great extent I agree with Dr. Jordan's remarks on these, but there is a little more to be said. *Distans* is larger, darker in colour, and coarser-looking than *lætus*, but I cannot find any reliable distinctions in *markings* between them—that is between *typical distans* and *lætus* received from Prof. Zeller. The original British specimens from near Thetford, to which the name *lætus* was applied, were *second-brood* specimens, taken late in July, 1868, and these were lighter and brighter-coloured than those of the first brood, which was not met with either that or the following year. I remember very well the day—June 4th, 1870—when the first specimens of the *first* brood were taken, when about thirty fell to two nets at Brandon. They were hiding among the lucern and other low plants, and were easily disturbed, but not always easily caught. Of these, the majority were larger and decidedly darker in colour than those of the second brood, and agreed accurately with types of *distans*; and whenever, in subsequent years, I collected at Brandon in June, I found these typical *distans* mixed with specimens inclining towards the brighter-coloured form, of which the second brood was mostly composed. There can, therefore, be no doubt whatever, that Dr. Jordan is correct in applying the name *distans* to our insect, and, I think, very little doubt that *lætus* is a variety of the same species. I admit a *little* doubt on the point, seeing that a very few specimens have been taken at Folkestone by Mr. Purdey and others of an *Oxyptilus* which agrees absolutely with continental *lætus*, but is rather paler than any Brandon specimen that I have seen, and, as far as I know, the *distans* form has not been taken at Folkestone. Probably, this only requires careful looking after, but it would, doubtless, be rare in that neighbourhood. I think I am at liberty to say that Prof. Zeller is also now of opinion that *distans* and *lætus* form but one species.

Mimæseoptilus bipunctidactylus, Haw.—This name seems to have been entirely overlooked by Dr. Wocke and Pastor Wallengren, both of whom have adopted *serotinus*, Z., which certainly is a much later name, but has, nevertheless, found its way into many lists and cabinets. I am strongly of opinion that Haworth's name should be restored.

M. plagiodactylus, Stn.—I quite agree with Dr. Jordan that this species "deserves investigation." I think that I have been investi-

gating it from time to time for a dozen years, and am not fully satisfied yet. The distinctive characters, as given by Mr. Stainton, are: the dark clouding on the costa, and the short black streak on the anterior lobe of the fore-wing.

This insect is common in chalky places among *Scabiosa columbaria*—sometimes swarming about disused chalk-pits,—from nine to ten lines in expanse of wings, usually with the markings more or less distinct, and sometimes very pronounced, but also frequently varying in the direction of faintness of these typical markings until in some specimens they entirely disappear. On the other hand, we find scattered all over the country, almost wherever *Scabiosa succisa* grows, the ordinary *M. bipunctidactylus*, varying from eight to ten lines, the smallest specimens generally occurring in the drier localities, where the scabious is stunted. These are usually without the clouded costa and black streak on the anterior lobe, but in some specimens both characters appear indistinctly, and, in some few, they are to be seen pretty distinctly; in fact, the two forms distinctly overlap. I remember that at Ranworth Fen a patch of very luxuriant *Scabiosa succisa* produced specimens that leaned altogether to the *plagiodyctylus* form; while at Brandon, among *Scabiosa columbaria* and *arvensis*, the two forms were so mingled, that no one could separate them. Now, in all these forms the black spot before the fissure is constantly present, it does not seem in the least degree to share in the inconstancy of the other dark markings, and the white border of the fissure is also usually visible.

From the lake district comes a form in which these reliable characters are much as usual, but the variable characters—the clouding and black streak—are so much exaggerated that the insect has been described as a distinct species. It has, however, been reared from precisely similar larvæ to those of *plagiodyctylus*, feeding in a precisely similar way. I have many times spent hours—with good magnifiers—over long series of these various forms, and have not been able to find any reliable point of distinction between them, and the only logical conclusion I can come to is, that they constitute but one species—*bipunctidactylus*, of Haworth. As already stated, I believe the few British specimens that have been reared under the name of *aridus*, Z., to be pale ochreous varieties of this species. I will not venture an opinion upon Zeller's *aridus*, of which I have but a single type, and which is recorded from Southern Europe, Northern and Western Russia, Armenia, and Palestine.

The larva of *M. plagiodyctylus*, with its mode of feeding in the

shoots of *Scabiosa columbaria*, is described in this Magazine, vol. viii. p. 156, and there is a strong impression on my mind that I have seen in print or manuscript a precisely similar description of the economy of *M. bipunctidactylus* in *Scabiosa succisa*, but I cannot now put my hand upon it. But Dr. Rössler, of Wiesbaden, describes the larva of the autumn brood as follows:—

“In September, 1863, I found some flowers of *Scabiosa succisa* inhabited by larvæ, which only betrayed their residence there by small threads on the blue petals. Brought indoors there appeared in a few days a spindle-shaped larva, verdigris-green, the broad dull red dorsal line margined on both sides with whitish-green as far as the usual position of the sub-dorsal line. Head, anterior legs, and spiracles brown-black, the anterior segments with some brown dots, the body clothed with isolated whitish hairs. For pupation it attached itself like a butterfly larva, the pupa hung downwards by the tail and was, like the larva, green with a red dorsal stripe. The imago appeared in ten days. The imago flies here among *Scabious* in dry sunny places and is not scarce in June and September.”

The larva of the June brood could not have fed in the flowers.

Mimæseoptilus Loewii, Z., seems to be correctly changed to *zophodactylus*, Dup. I am quite of Dr. Jordan's opinion that *Hodgkinsoni* is merely a slight variation of this species.

Much confusion seems to have resulted from the fact that our old and well-known *M. fuscus*, Retz., *fuscodactylus*, Haw. (feeding on buds of *Veronica chamædrys*), is really *pterodactylus*, L., and that the species which stood in our lists and books as *pterodactylus* (the *Convolvulus* feeder) is *monodactylus*, L. This last name is wonderfully suitable to this species, which, when at rest, is a conspicuous object, with its fore and hind wings rolled up into “one finger,” pointing each way like a sign post.

Pembroke: 14th November, 1881.

NATURAL HISTORY OF *EMMELESIA BLANDIATA*.

BY WILLIAM BUCKLER.

The habits of the genus *Emmelesia* seem to make it such a difficult matter to get hold of the larvæ of some of the species, that I feel more than ordinary pleasure in being able to say that I have removed *blandiata* from my list of desiderata: of course it was not one of the “unknowns,” for the food-plant, and a description after Freyer, had been given in Stainton's Manual, yet for all that I could see no chance of obtaining the larva for years; and now—it has not been by means of British examples that I have worked out its history, although the help came from an old ally.

On 21st of August, 1880, a sultry day with hot sun and occasional showers, the Rev. J. Hellins was strolling in advance of his vehicle through a part of the Brunig pass, between Alpnach and Brienz in Switzerland, and was watching the swarms of butterflies on the wing, when he noticed a small grey moth busy over a plant of Euphrasy (*Euphrasia officinalis*), which was growing on a bank a little above his head; some misty recollection of the above-mentioned notice in the Manual made him think of *blandiata*, and he tried to catch the moth in order to see if it was that species, but failing in this, he came back to the plant about which it had been flying, and pulling several shoots of it found that he had secured about a dozen of the eggs that had just been deposited underneath the leaves amongst the open flowers, and these, unfortunately supplemented by some fresh shoots gathered early next morning, and so damp with dew, he posted in a tin box to me on the 22nd, and I received it in the afternoon of the 23rd.

On opening the box I found most of the Euphrasy already decayed, for it is one of the plants that fade rapidly from damp, and though I could see several empty egg shells, there were only four or five tiny larvæ still living, but there was also one bigger and finer than the rest, just emerging from a round hole in a seed vessel, where it had evidently fed on the unripe contents; a few eggs had remained unhatched, and from these one larva appeared next day, and two more the day following, when I also found another larva of an earlier batch that had already moulted once if not twice.

The young larvæ soon ate their way into the seed capsules and therein must have moulted, for though their small entrance hole was detected in the upper part of some capsules, they themselves could be seen but seldom for some time until they had acquired a certain amount of growth, and until the necessity for more food compelled them occasionally to come outside and attack fresh capsules, when they could be better observed; especially was this the case after their last moult, when (like the larva of *E. unifasciata*, Ent. Mo. Mag., vi, p. 186) they assumed a handsome dress admirably designed in harmony of aspect with the food-plant for their protection, whilst living for the remainder of their larval existence more or less exposed; for often they remained with their heads buried in the seed capsules and the greater portion of their bodies resting outside, and motionless for hours during the daylight; but the succession of brilliant little flowers given forth by the plants seemed quite to divert the eye from the larvæ, and, moreover, their assimilation to the stems and leaves was so perfect, that even when one knew they were present on a shoot, it was with difficulty they could be detected.

The two most advanced in growth moulted the last time in the evening of the 1st of September, the others at intervals later, and the first entered the earth on the 10th, more followed soon, and the last on the 18th.

The only moth bred as yet, a male, appeared on 14th of August, 1881, and enabled me to make sure of the species, though probably more will emerge in a future season in conformity with the habit of some of its congeners.

Again, during this last August, Dr. T. A. Chapman, most kindly sent me from Switzerland, amongst other things, a good supply of Euphrasy shoots (gathered near Engelberg, some 12 or 15 miles, as the crow flies, from the spot where Mr. Hellins had seen his moth the year before), on which he had detected eggs, and from these Mr. Hellins has succeeded in rearing to full growth about a dozen larvæ evidently of the same species, and has thus enabled me to supplement my description drawn from the examples I had reared myself: these were about a week later in their changes than the larvæ of 1880.

The egg of *blandiata* is oblong and somewhat flattened, one end more rounded than the other; rather more than $\frac{1}{10}$ inch long and about $\frac{1}{10}$ inch wide, the shell reticulated rather coarsely and shallowly, not very shining, and of a deep yellow colour; when empty the shell looks white.

The newly-hatched larva is rich yellow, with blackish-brown head and narrow plate across the middle of the second segment, its skin glossy, the bristles from the usual spots are somewhat clubbed; in four days' time it is decidedly grown, still yellow,* and with the addition of a dark purplish-brown dorsal line, and a sub-dorsal line rather paler than the yellow ground and faintly edged with darker; after a moult and increase of size the colouring is more opaque and of a light buff-yellow, afterwards a very faint brownish colour tinges the back and a slight pearly greyish-whiteness the belly; as they grow they become pale dull green, with a dull purplish dorsal line; but they continue to be very plain little larvæ, until the last moult, which is passed when the length of three-eighths of an inch is attained; at full growth the length is half an inch or a trifle more, and the larva is not quite so thick in proportion as its congener *unifasciata*, though the segments are plump and well defined, each having two transverse wrinkles near the end; the form tapers gradually forward from the

* The rich yellow colouring of the egg and young larva strikes me as assimilating wonderfully with certain spots, apparently some fungus, with which the Euphrasy is much infested; there is also a little yellow grub, apparently Dipterous, that shows the same colouring, but we have not reared any to full growth.

seventh to the head, which is the smallest, and backward a little from the tenth to the end of the thirteenth. The general ground colour is green varying in richness in different individuals, and is yellower and brighter for the first few days; the head is very glossy, greenish-yellow faintly tinged with pinkish, and having two rows of pink freckles down the front of each lobe, the ocelli large and black; the green of the body is well contrasted with the design on the back which occupies the space there between the trapezoidal warts, and is attenuated a little on the posterior and thoracic segments, beginning on the second as merely twin lines, but on all the others consisting of three equally stoutish lines of very dark crimson, of these the dorsal line in the centre is straight, but each outer one in its course along each segment bends inward a little towards the middle in symmetrical progression, enclosing a ground of deep rose-pink within them at either end, but which is lost in the middle of the segment by the complete fusion there of the three dark crimson lines together in a mass, just where the middle of the bends bring them near each other; after an interval of green comes the sub-dorsal line of very deep pink, and at a less interval a thicker and rather sinuous lateral line, and at a wider interval again below a sub-spiracular line of the same deep pink colour; the tubercular warts are whitish with minute black central dot bearing a fine short bristle, the anterior pairs of the trapezoidals are quite close to the crimson outer curves of the dorsal design; one wart occurs upon the anterior thickest part of the lateral sinuous line, another behind each spiracle, and others again beneath: the roundish spiracles are blackish with pale centres; the yellow-green of the back is more yellow close to the crimson design, and also on the tumid spiracular region, which on the posterior segment and edge of anal flap is primrose-yellow; against this the outer crimson surface of the anal legs contrasts strongly; beneath on the green belly are three paler lines, the central one the more noticeable: as the larva matures the crimson markings of the back become purplish, and the general ground a deeper green, though the spiracular ridge remains yellowish to the last.

The foregoing describes what I believe to be the typical or complete design of the larva, for it was the one shown by all the larvæ in 1880, and by most in 1881, but amongst the latter there occurred three or four of a variety showing an incomplete form of the dorsal design, which may be regarded as substantiating in a manner the description in the Manual after Freyer.

In this variety the dorsal line as usual is complete throughout,

but at the beginning of every segment the two outer or curving lines are absent as far as the first pair of warts, and the pink ground so faintly shown as scarcely to be noted there, but the remaining parts of the design are quite perfect, and so stand out like a dark arrow-mark, or in other words a very elongated triangle at the end of each segment, through which passes the continuous dorsal line.

There were also two or three larvæ with the full pattern, but of much duller colouring, being pale brownish with a pink tinge, and the lines of the pattern also duller.

The larva goes into a light soil for its final change, and forms a compact little cocoon not quite three-eighths of an inch long and about half as wide; the pupa measures five-sixteenths of an inch in length, it is without any peculiarity of form, and of a bright yellowish-green colour for some time, having a broadish stripe of crimson down the middle of the back of the abdomen, suggestive of the larval design, and with rather a glossy surface.

Emsworth: *December 7th*, 1881.

A NEW SPECIES OF *HEMITELES*.

BY E. PARFITT.

HEMITELES PERSECTOR, *n. sp.*

Nigra, abdominis segmentis 2-4, antennarum basi, pedibusque rufis.

Shining, with no preceptible sculpture, metathorax sub-opaque.

Head transverse, face rather prominent below the antennæ, clypeus distinctly separated from the face, cheeks not buccated, space between the eyes and mandibles wide, face between the eyes wider below than above, covered with short pale fulvous pubescence, antennæ long and slender, flagellum 17-jointed, 1st joint larger than the 2nd, about five times as long as wide, joints not quadrate. Jaws and palpi bright yellow. Thorax slightly pubescent, about one-half longer than high, parapsides faintly impressed; the upper part of the metathorax short, back rather sloping, supero-medial area transverse, rounded at the sides, slightly incurved in front, and faintly closed behind, posterior face with two distinct central lines, postero-medial area elongate, sides almost parallel. Metathoracic spiracles circular. Abdomen: 1st segment elongate, narrow, about twice as wide at the apex as at the base. Spiracles placed just behind the middle, post-petiole with two keels, and a slight depression between them, nearly half as long again as the hind coxæ and trochanters; remainder of abdomen ovate, segments transverse, the 4th and following very short, aculeus nearly two-thirds the length of the abdomen. Legs rather slender. Wings: areolet pentagonal open at the apex, inferior exterior angle of the discoidal cell projecting beyond the corresponding angle of the areolet, stigma moderate, transverse anal nervure sub-opposite, divided below the middle. Scape, 1st and 2nd joints of flagellum, 2—4 segments of abdomen, and legs red, the latter paler at the base, the posterior darker than the two front pairs.

Female, length 4—5 mm., or 2½ lines.

This species is very distinct from *H. gyrini* described in the Ent. Mo. Mag., vol. xviii, p. 79, and is, so far as can be ascertained, undescribed. It was bred from some pupæ of *Gyrinus natator*, collected by the Rev. J. Hellins at the same time and place as stated before in regard to *gyrini*, but this did not come out so soon as that species, and consequently was not described nor in time for my catalogue of *Ichneumonidæ* of Devonshire. This insect has the facies of *gyrini*, but it has the basal half of the antennæ red, and the thorax is quite smooth without any lines or markings, and the abdomen is broadly ovate, all of which distinguish it from the former species.

Exeter: November 30th, 1881.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(continued from p. 154).

On page 241 of Vol. xiv of this Magazine are some remarks upon a supposed aberrant form of *Brachytænia Hartmanniana*, L. (*scriptana*, H.), found by Dr. Wood in Herefordshire in the year 1877. During the succeeding three years, although constantly looked for, it was not seen; but Dr. Wood's unflagging zeal has been rewarded this year by the capture of nearly a dozen specimens. These he has sent for examination, pointing out their perfect constancy in shape, colour and marking, and the reliable marks of distinction from *Hartmanniana*, which is well known to be little liable to variation, and strongly urging the claim of this form to rank as a distinct species.

I am inclined to think that the claim is good, and, therefore, propose to name this pretty species after the entomologist who has devoted so much time and pains to working it out.

BRACHYTÆNIA WOODIANA, *n. sp.*

Head and front of thorax black, upper part of thorax whitish, antennæ light brown, fore-wings chalky-white with very numerous small clouds of bluish-grey, basal blotch only indicated by a dark grey cloud on the base of the dorsal margin, central fascia broken, consisting of a blue-black triangular or sub-quadrate costal blotch, having an extension or neck connecting it with a blue-black, undulating, longitudinal streak near the middle of the wing, below which are two pale grey clouds. Costal streaks short, blue-grey. Beyond the central fascia are three delicate curved lines of tiny blue-grey clouds, as in *Penthina betuleтана*. Cilia whitish, dotted with grey. Hind-wings rather dark grey with similar cilia.

Exp. $7\frac{1}{2}$ lin.

Tarrington, near Ledbury, Herefordshire, July.

It is slightly smaller and less robust in body than *Hartmanniana*, and the costa of the fore-wings is not so much arched. It also differs from that species in its white ground colour, blackish head and collar, the form of the large costal blotch, and the arrangement and number of its delicate cloudy markings.

It is found exclusively about apple trees, upon which its larva doubtless feeds, although it has not yet been discovered, and one of the moths taken this year was actually running up the trunk of an apple-tree with unexpanded wings just out of pupa. *Hartmanniana*, which occurs on willow trunks in the neighbourhood, has not been found in the orchards at all, nor have the two species been found anywhere mixed together.

It is probable that the species is widely distributed in Herefordshire, as a specimen has been taken near Leominster.

Pembroke: 9th December, 1881.

Notes on the past season, and on the occurrence of certain Lepidoptera and Coleoptera in the Forest of Dean.—In this part of Gloucestershire the present year was from a naturalist's, standpoint, notable for the abundance of insect life that prevailed throughout April, May, June, and the opening days of July. Some of the commoner kinds of moths, such as *P. pilosaria*, *H. progemmaria*, *H. leucophæaria*, *T. stabilis*, and *T. viridana* were observed to be especially numerous, and two *Lepidoptera*, which are not apt to remain in the duplicate drawer so long as the before mentioned, viz.: *A. prodromaria* and *C. ridens* (some nice varieties) were nearly as common, being taken by the score, the majority of them as soon after emergence from the pupa as their full developement would permit. When these two species had lost their bloom, and while they were becoming tattered and torn, and assuming the bleached appearance indicative of Lepidopteral decrepitude, zest was given to a walk in the Forest by a good chance of taking a series of *N. cristulalis* and *T. extersaria*, varied now and then with fine examples of *N. trepida*, *N. chaonia*, *E. dolobraria*, while later on *H. velleda* (var. *carnus*), *S. fagi*, and *A. herbida* were to be found by trunk hunting. When in the month of June the beating stick and net were employed, *E. advenaria*, *A. prunaria*, *A. sylvata*, *A. Blomeraria*, *N. pulveraria*, and *B. lancealis* fell victims to this method of collecting. Owing, however, to a run of rainy or windy weather setting in just when the two "waves" were at their best, only a few specimens were obtained worthy of a place on the setting board. Last year they were by no means difficult to secure in good condition. In the wood, which is the head quarters hereabouts of "Blomer's wave," *L. rubricollis* turned up at rest on grass stems, and *C. propugnata* on trunks, and the larva of *P. galactodactylus* mustered in force on the underside of burdock leaves. Towards the middle of April a few *N. hispidaria* were secured, and have proved a desirable supplement to the representatives of the species already in the collection.

By the beginning of June, the spring moths that are common in the forest had passed away, and the ova they deposited had produced larvæ. These creatures were in myriads on the oaks; and when, in the first week of July, their ravages had reached a maximum, many an acre of woodland could not show a tree with more foliage on it than there would be in December. Larvæ-beating, however, turned out to be an extremely disagreeable occupation, chiefly on account of the numbers of a large dark bronze-green *Pentatoma* (?) the stick dislodged from the branches, so that I made only one trial of that kind of work, but from it I ascertained that the devouring host consisted in the main of "stung" caterpillars, and, accordingly, do not expect that an abnormal quantity of imagos will appear next year. A reference to the note-book shows that from July to the conclusion of the season, captures just here have been below the average, and consist principally of the commoner kinds of the *Heterocera*. The *Rhopalocera*, however, of which twenty-four species have been observed in the district, did not altogether fail to add to my stock of duplicates, though the only one taken was *V. c-album*, an insect I have looked for to no purpose hitherto in several localities. It was a charming pastime, therefore, one day last September to single it out from a mixed crowd of *urticæ*, *polychloros*, *Io*, and *Atalanta*, and to box a long series of it in good order, a mile or two from here, making the fiftieth of our *Diurni* with which I have had to do afield.

With respect to *Coleoptera*, many of those species I have recorded as taken in 1878—80 have occurred again this year under similar conditions; so such only are enumerated as in their capture present some point of difference, as compared with their predecessors. Thus *Cychnus rostratus* occurred by stone-turning; *Rhizophagus cribratus* by beating whitethorn blossom; *Corymbites pectinicornis* by searching grass-stems; *Lasia globosa* by examining felled trunks. Also some mention must be made of the extraordinary abundance of *Calosoma inquisitor* and *Silpha 4-punctata*. As an instance, one afternoon in June I bottled of the former more than a hundred examples, and dozens of the latter. The majority of them were either crawling or motionless on the trunks and branches or running along the ground, but a fair number were seen flying in the sunshine. These insects appear to be somewhat local, as they were common only in a comparatively small area. The check they exercised upon the devastating power of Lepidopterous larvæ was very palpable. In those portions of the forest in which the trees were stripped of foliage, I did not notice a single specimen of the larger beetle.

A note on some species hitherto not recorded, to the best of my belief, from here may be of interest, especially as the number of Coleopterists appears to be rapidly increasing, possibly because the study of the Order is so very attractive, from the diversity of structure and economy of its members, or because, at present, there is little liability of continental stocks being planted out, and their offspring being foisted upon one as indigenous. In carcase, *Silpha thoracica*; in toad-stool, *Gyrophæna gentilis*; by beating foliage and blossom, *Paramecosoma melanocephala*, *Rhamphus flavicornis*, *Magdalinus barbicornis*; from Sparganium, *Donacia linearis*; by sweeping, *Philonthus sanguinolentus*, *Cercus bipustulatus*, *Galeruca viburni*; on stumps, *Quedius scitus*, *Platypus cylindrus*; under birch bark, *Epuræa parvula*; on felled timber, *Brachytarsus scabrosus*; in decayed wood, *Pteryx suturalis*; in moss, *Mycetoporus clavicornis*.—A. E. HODGSON, Coleford, Gloucs. : November, 1881.

Rare Coleoptera in Scotland.—While spending a holiday this summer in North Britain, I took some examples of *Amara Quenseli*, *Harpalus 4-punctatus*, *Agathidium rhinoceros*, and *Hylurgus minor*. These were the principal captures, but *Miscodera arctica*, *Tachinus proximus* and *T. pallipes*, *Anthophagus alpinus*, *Acidota crenata*, *Agathidium rotundatum*, *Hydnobiuss strigosus*, *Otiorhynchus maurus*, and a "pug" I do not recognise, which may be nothing more than a strange form of *Eup. succenturiata*, besides fine varieties of common insects, also occurred and perhaps are noteworthy.—ID.

Pterostichus vulgaris, &c., in a frog's stomach.—On opening the stomach of a dead frog, in the summer, I found inside it three large beetles: *Pterostichus vulgaris*, *Harpalus æneus*, and *Barynotus obscurus*: the two former were but little injured, and the latter was quite perfect in every respect, except that most of the scales had been rubbed off. These three beetles almost filled the stomach, and it seems strange that its thin covering can resist the jaws and claws of large *Carabidæ*; there must be some poisonous effect in the saliva which destroys them at once.

I mentioned this fact to Mr. Matthews, who told me that the frogs had not got it all their own way: a little while ago, he saw a frog on his garden path, evidently in trouble, and, on examining it more closely, he found that a large *Carabus violaceus* had fast hold of it by the leg. He kept the frog to see what would happen to it, and it soon died, evidently poisoned by the acrid excretion of the *Carabus*: this excretion seems to be a powerful irritant poison, and to be capable of producing considerable pain if discharged over the human face, or any part of the body where the skin is thin.—W. W. FOWLER, Lincoln: December 9th, 1881.

Lebia crux-minor in Japan.—On the 31st July I crossed an elevated pass in the centre of the main island called Shiwojiritogè, the altitude was nearly 3500 feet, and the temperature about that of a summer day in the south of England. The whole district was gay with the flowers of Siberian type, and there were no trees or shrubs, so that the general aspect viewed from a distance was that of the Sussex downs, but when seen close, the flowers were massed together, and rose one or two feet high. Here, on a species of *Arctium*, I found a large *Larinus*, and in beating to get specimens, one or two *Lebia crux-minor* fell into my umbrella, I soon discovered plenty of them feeding on the saccharine matter exuding from the burrs. Associated with them, I also discovered a new *Lebia*, which was, however, very scarce, and I secured but three or four during more than an hour's search. The number of the commoner *Lebiæ* I saw during the time must have been over 100, and they were all of the north European type with red legs, and I did not find one of the Italian var. *nigripes*, which is the form usual at Nagasaki, in the southern island of Kiushiu. If I am ever at Brighton again at the right time, I shall search the burdock for *L. crux-minor*.—G. LEWIS, Grand Hôtel, Yokohama: October 16th, 1881.

Curious variety of Argynnis Paphia.—At a field meeting of our Naturalist's Field Club which took place near Saundersfoot, Pembrokeshire, last July, a capture was made of sufficient interest to be worthy of special record—a female *Argynnis Paphia* of normal colouring on the upper-side, but having the usual greenish tinge of the under-side of the hind-wings replaced by a distinct tinge of purple. The

contrast to the ordinary form of the insect is very beautiful. This capture was made by the Vice-President, the Rev. Clennell Wilkinson, and the insect is now in his cabinet.—CHAS. G. BARRETT, Pembroke: 14th December, 1881.

A new species of Coleophora (C. adjunctella, Hodgk.).—Quite a dozen years ago, on a salt marsh beneath Humphrey Head, near Ulverston, I took a considerable number of this insect, and sent it away pretty freely as *Col. salinella*; about three years ago I paid a visit with Mr. Threlfall to the same place, and a two days' hunt only yielded a score or so for each of us; since then I have made the acquaintance of the true *C. salinella* which I find is a totally distinct species from mine, *C. salinella* being a larger insect and of a pale yellow colour, whereas the insect which I propose to name *Col. adjunctella* is a shorter winged insect and of an olive-brown ground shade, it is clearly distinct from *cæspitiella* by the white streak that runs along the costa; also the wings are more arched, and in fine specimens there is almost an absence of streaks; the antennæ are much darker, nearly black and more robust than in *C. cæspitiella*. The food of the larva has yet to be discovered; there were neither rushes nor *Luzula* about that I remember; we had to get them by creeping on our hands and knees, the place being too bare to sweep and had to place our backs against the wind when we wanted to box any of the specimens.

Mr. Sang looked at my fine series and agrees with me as to its distinctness.—J. B. HODGKINSON, 15, Spring Bank, Preston: December 5th, 1881.

[Mr. Hodgkinson's insect is very distinct from any species of the genus with which I am acquainted. It resembles most nearly *C. badiipennella*, having like that insect a distinct pale costal streak from the base to the costal cilia, but the ground colour of the wings is far glossier than in *C. badiipennella*.—H. T. S.]

Larvæ of Scopula lutealis and S. prunalis.—Probably, during the last two seasons, I have collected and sent away more larvæ of *lutealis* than any one else in Britain; and I believe the very larvæ figured and described by Mr. Buckler were sent from here to Mr. Fletcher by myself. [Yes, this is so.—EDS.] With care, the two species are separable, but yet they are so much alike that I have scarcely ever sent away a batch of *lutealis* without saying "possibly a few *prunalis* may be mixed with them." I have had a tolerable batch of each species feeding side by side, and I have no hesitation in saying that only those accustomed to larva-rearing would have distinguished one from the other. The distinguishing character, I think, is the black spot so distinct on each side of the second segment in *prunalis*, but absent in *lutealis*. All being well at the end of May or early in June (Mr. Buckler's were late specimens), I shall be pleased to send these larvæ to any Lepidopterist who would care to compare the two species. I described this larva from a single specimen in 1877 (see Ent. Mo. Mag., xiv, 114).—GEO. T. PORRITT, Highroyd House, Huddersfield: December 1st, 1881.

Sericomyia borealis "singing" while at rest (cf. p. 159, ante).—A tinted figure of *Sericomyia borealis* will be found in my "Insect Variety," pl. iv, fig. 7, and at page 216 there is the following remark. "In addition to the instances preferred, I have heard the primitive spiracular notes of the hover-flies given out by a showy northern species, *Sericomyia borealis*, that frequents brambles in the West Highlands, as it alighted on rotten stumps with closed wings, to fulfil the maternal duty

of oviposition." The observation thus recorded was made on the precincts of what was once the laird's estate at Whitehouse, on West Loch Tarbert, in Argyleshire, and in my note-book the entry runs thus: "19th of August, 1876. A large, yellow-belted hover-fly, depositing on the rotten stumps in the sunshine, it utters a plaintive note every time it settles with the wings closed over the back, but when it alights with them expanded it is mute. There is a slight tremulous motion at the extremity of the wings as it gives forth its note, which it does frequently, singing to itself as it were, as it sits. *Sericomyia borealis* and *Criorhina oxyacanthæ*, another large dipteran which mimics the carder-bee, are equally fond of the ragwort- and knap-weed-heads." That the fly in question was the female, I am assured by the presence of a short ovipositor, that in one of my specimens shows a desiccated bunch of minute ova protruding; and that it was engaged in oviposition, its actions led me to infer. The economy of this group is, as is known, very various.—A. H. SWINTON, Binfield House, Guildford: December 2nd, 1881.

Sericomyia "singing" while at rest.—I have just read Mr. Bloomfield's note on *Sericomyia borealis*, and hasten to offer my mite of corroborative testimony to what he has published.

One day during the past autumn I went with a small party for a walk on Dartmoor, near Okehampton; after some miles of rough tramp up and down several tors as the afternoon was drawing on, we found ourselves on a heap of stones on the top of Cawsand, and were glad to rest there awhile; before long, a piping sound was audible, and one of the party said the wind was whistling; but to this explanation I demurred, having some recollection of having heard the noise before, so, looking round, I soon saw several large flies resting on the stones, and was presently able to convince my friend that the sound came from them: the next thing was to try to capture one, but they were so watchful, that it was with great difficulty I managed to stun one with my felt hat, when I pill-boxed it, and brought it home for Mr. Parfitt; from him I learn that it is a *Sericomyia*, and, probably, the species mentioned by Mr. Bloomfield.

The first time these flies caught my attention was more than thirty-five years ago, when I was spending a holiday on Dartmoor, and I have since seen and heard them from time to time, but—of course, in the usual way—let them alone, for some Dipterist to look after.

How they make the noise, I cannot tell, but it is quite certain that they make it while resting on the stones.—J. HELLINS, The Close, Exeter: 3rd December, 1881.

The "Revue Coléoptérologique."—The approaching publication of yet another monthly entomological journal is announced for February 1st, under the above title, devoted to bibliography, descriptions of new species, synonymy, &c., concerning *Coleoptera* only. The prospectus is issued by Mons. Constant Vanden Branden, of 69, Rue de la Madelcine, Bruxelles.—EDS.

Obituary.

John Gray died at his residence, Claygate, Esher, on November 27th last, at the age of 69. He was, we believe, originally a manufacturer at Bolton, but he retired from business many years ago, and devoted himself to yachting expeditions in connection with entomology and natural history generally. He published very

little,* but his services to entomology were, nevertheless, great. It was in his yacht, the "Miranda," that the late Rev. Hamlet Clark made his voyage to Brazil, so graphically described in "Letters Home" (cf. Ent. Mo. Mag., iv, p. 120), and in which the late Mr. Wollaston made most of those voyages to the various Atlantic Islands that were so pre-eminently productive of scientific results, and during which Mr. Gray shewed himself a most enthusiastic collector and acute observer. He had been in failing health for some years. So long ago as 1850 he was elected a member of the Entomological Society of London, and his connection with the Society was continued until his death, as it also was with this Magazine, to which he was an original subscriber. Possibly his last public appearance amongst entomologists was on the occasion of the excursion of the Entomological Club to Esher some four or five years ago, and he was then in feeble health.

ENTOMOLOGICAL SOCIETY OF LONDON: Oct. 5th, 1881.—H. T. STAINTON, Esq., F.R.S., &c., President, in the Chair.

Mr. McLachlan exhibited a parthenogenetically-bred example of *Gastrophysa raphani*, sent to him by Dr. Osborne (*vide ante* p. 128).

Mr. Theodore Wood exhibited a *Notiophilus biguttatus* abnormally punctured.

Mr. Meldola exhibited, on behalf of Mr. Argent, several interesting varieties of British Butterflies.

Mr. Pim exhibited the example of *Harpalus discoideus* recorded in this Magazine (*ante* p. 112).

Mr. Fitch exhibited, on behalf of Mr. Bignell, *Formica umbrata*, var. *mixta*, Nylander, from Stonehouse, new to this country.

Mr. Olliff exhibited an example of *Papilio Americus*, Kollar, with abnormal neuration occasioned by deformity in one wing.

A communication from the Colonial Office was read regarding the damage occasioned to cocoa-nut trees in the Fiji Islands by *Lopaphus cocophagus*, one of the *Phasmidæ*; and also respecting the ravages of locusts in Cyprus.

Prof. Westwood communicated a description (with figures) of an insect from Ceylon, apparently immature, the ordinal position of which was doubtful. He proposed for it the generic term *Dyscritina*.

Dr. Sharp communicated descriptions of new species of *Coleoptera* from the Hawaiian Islands.

Mr. C. O. Waterhouse read descriptions of new species of *Rutelidæ* from Ecuador.

Mr. Cameron communicated a paper on new species of *Hymenoptera*.

November 2nd, 1881.—The President in the Chair.

Mr. C. O. Waterhouse exhibited a variety of *Ourapteryx sambucaria*, in which the transverse lines approximated, taken by his brother at Wandsworth.

Mr. W. F. Kirby exhibited the specimen of *Antheræa macrophthalmus*, n. sp., from the Gold Coast, described in this Magazine, *ante* p. 146. Also a series of beautiful dissections of saw-flies and other *Hymenoptera*, made by Mr. Cameron, with especial reference to the "saws" of the former, as indicating specific differences. A discussion ensued as to the most suitable objective for entomological purposes; Messrs. McLachlan and Waterhouse preferring a two-third inch; the Rev. A. E. Eaton stated that the variation in the magnifying power of objectives by various makers was a source of much confusion of opinion on this point.

* In Hagen's "Bibliotheca," vol. i, p. 302, "John Gray, Wheatfield House, near Bolton-le-Moors," is credited with the publication of various entomological notes in Morris's "Naturalist" from 1851 to 1854, including the description of a new Longicorn beetle (*Prionus Westwoodianus*). We believe this results from mistaken identity. All these notes were by a "John Gray," of Glasgow, a different person (so we think) from the subject of this notice.—Eds.

The Rev. A. E. Eaton exhibited a portion of honey-comb built against a wall without any protection whatever; it contained living bee-larvæ: also a specimen of a wood-louse, *Porcellio scaber*, captured in Iceland by Mr. Coles, and a series of beautiful drawings of wood-lice, executed by Mr. Hollick.

Dr. Lang exhibited an example of *Lycæna Icarus*, var. *Icaroides*.

Mr. Distant exhibited a species of *Cicadidæ* from Borneo, probably forming a new genus, in which the "drums" were developed to such an extent, as to equal or exceed the length of the abdomen.

Mr. Billups exhibited an example of *Dufourea vulgaris*, from Woking (*cf. ante*, p. 161).

Sir S. S. Saunders exhibited *Scleroderma domestica*, Westwood, received from M. André, bred from the larva of a longicorn beetle; also *Diptera* injurious to figs.

The President exhibited, on behalf of Dr. Buchanan White, some remarkable tubes (some nearly an inch in length) manufactured by Lepidopterous larvæ, from the white excrement of dogs; they were from Aden. He likewise remarked on the differences between the larvæ of *Cerura vinula* and *erminea* (*cf. ante*, p. 161), with respect to a moth from Hertfordshire, received from Mr. Piffard, and which the latter thought might be *C. erminea*, an opinion in which the meeting did not agree.

Mr. C. O. Waterhouse exhibited a specimen of *Aërophilus Bonnairei*, Signoret, from the late Mr. F. Smith's collection, labelled "Polperro" (*cf. ante*, p. 145).

Mr. Butler concluded his paper on the Heterocerous *Lepidoptera* of Japan.

Prof. Westwood communicated a paper on the *Diptera* destructive to cereals in Britain.

December 7th, 1881.—The President in the Chair.

Mr. A. R. Grote, the American Lepidopterist, was present as a visitor.

A. J. Scollick, Esq., of Albion Lodge, Putney, was elected a member.

A letter was read from the Colonial Office regarding the plague of locusts in Cyprus, and stating that on further search the egg-tubes of the locusts were found to be much infested with the parasitic larvæ of *Bombyliidæ* (numerous tubes and parasites were exhibited), although previously believed not to occur in the island.

Mr. W. C. Boyd, exhibited an example of *Ennomos tiliaria*, in which the two transverse lines on the wings were confluent for a portion of their length.

Mr. C. O. Waterhouse exhibited *Scenopinus fenestralis* bred from root of *Aconitum*, and *Phora rufipes*, parasitic on *Nematus ribesii*.

Mr. Pascoe exhibited a larva of some large species of *Myrmeleonidæ*, which had been found living in this country in a barrel of currants imported from Zante.

Mr. McLachlan exhibited weevil-larvæ (possibly of *Brachycerus*) sent to him by Mr. G. F. Wilson, and stated to be causing great damage to Japanese lilies in Mr. Wilson's garden at Weybridge.

Mr. Oliffe exhibited *Harpalus cupreus*, Dej., a very rare British beetle, captured by Mr. Horne, in the Isle of Wight.

Mr. Pim exhibited a specimen of *Telephorus* from West Wickham that he had been unable to identify; it was stated that it was possibly a form of *T. lituratus*.

Sir S. S. Saunders read further notes from Mons. André respecting a species of *Scleroderma* parasitic on a Longicorn larva.

Mr. C. O. Waterhouse read notes (illustrated by diagrams) on *Blastophagus sycomori* and *psenes*, of Linné, detailing the results of his examination of the specimens in the Linnean cabinet. He was of opinion that, although the specimens considered by Sir S. S. Saunders as types of *psenes* bear no label, or other indication in handwriting, they are veritable types, and the identical specimens received by Linné from Hasselquist. Sir S. S. Saunders made a long explanation to the same purpose.

Mr. Butler communicated a paper on Heterocerous *Lepidoptera* collected in Chili by Mr. Edwards.

Mr. Distant read Descriptions of new species of *Cicadidæ*.

NOTES ON *TENTHREDINIDÆ*.

BY P. CAMERON.

(Continued from vol. xvii, p. 67).

TENTHREDO SCOTICA, *sp. n.*

Black; clypeus, labrum, a line round the lower part of the eyes, one on the pronotum, two spots over the posterior coxæ, apical three-fourths of the under-side of the front coxæ, and an irregular spot on the apex of the two hinder ones, white. Legs pale yellow, except the greater part of the coxæ, which is black, and the extreme apex of the posterior tibiæ and the tarsi, which are dull fuscous. Wings almost hyaline, costa dull reddish, stigma black. ♀. Length, $5\frac{3}{4}$ lines.

Similar to *T. dispar* in size and form, but having (apparently) the antennæ and metatarsi shorter, the head more opaque and punctured, and differing otherwise in the coloration of the legs and face; the saw also differs.

Rare. Taken near Dumfries, in June.

THE BRITISH GREEN SPECIES OF *NEMATUS*.

With the valuable assistance of Mr. J. E. Fletcher, I have subjected our green species of *Nematus* to a revision, and have satisfied myself that we possess seven, if not eight, species. These are:

1. *N. Bergmanni*, Dbm, *sec.* Thoms., = *prasinus*, Htg.
2. *N. glutinosæ*, *sp. n.*

Green, or testaceous-green; the space enclosing the ocelli, the usual marks on mesonotum (as in *miliaris*), a ring surrounding the cenchri, a small one behind them, and a row of transverse marks on back of abdomen (becoming narrower towards the apex), black. Antennæ somewhat shorter than the body, filiform, black, fuscous beneath, the 3rd joint a little longer than 4th; the head bulges out distinctly behind the eyes; looked at from above, the front projects sharply from the surrounding parts, and is furrowed between the antennæ. The frontal (pentagonal) area is well defined and square at the apex; the antennal fovea is indistinct, but a well-marked furrow comes down on either side of it from the outer side of the frontal area, and curves round the base of the antennæ. The central furrow on vertex is well defined, broad in front, narrow behind. Spurs a little more than one-fourth of the length of the metatarsus, being as long as the cerci. Stigma greenish-white.

The ♂ has the antennæ longer than the body, with the 3rd joint shorter than the 4th; the lower part of the body and the sides of the abdomen above are rufescent; the upper part black, the thorax entirely so, save an incomplete ring on scutellum, the central part of which is black. The hinder tarsi are fuscous-black; the stigma fuscous. Length, $2\frac{1}{2}$ —3 lines.

Very similar to *miliaris*, Pz., = *viridis*, Htg., = *microcercus*, Thoms., but the front is wider between the antennæ, and does not project so

much ; antennal fovea less defined, head smaller, cenchri smaller, spurs shorter compared to the metatarsus, which is itself shorter compared to the 2nd joint, abdomen with a broad and continuous black band, scutellum marked with fuscous in the centre, and the frontal area more distinct.

The larva feeds on alder. It is green, the head is of a darker green, especially on the top ; a black line goes from the top to near the eyes, and another line goes from the top half way down the face, mouth brownish ; mandibles black at the tips. The body is covered with tubercles of a darker colour than the body, and generally irregularly oblong in shape. On the 2nd and last segments they are somewhat irregularly arranged, but on the middle ones they are usually in two pairs above, and three single ones in a line below them, while there is a longer, slightly curved one over the abdominal leg, and one or two smaller tubercles over that. Two curved lines are over the legs, which are glassy-white ; the claws are brown. On the back are two white lines ; there is no distinct black line along the sides, but a thin white one, which runs through the spiracles. The cerci are black, as well as the space immediately behind them.

It is double-brooded, and is freely parthenogenetic in confinement, the eggs laid by the virgin females yielding only males.

Common in Scotland, and at Worcester.

3. *N. miliaris*, Pz., = *viridis*, Htg.

4. *N. salicivorus*, sp. n.

Pale testaceous-green ; the vertex in the middle (the black being continued as a small rounded mark behind), the usual three marks on mesonotum, the space between the cenchri (separated in the middle), black ; on the base of abdomen are one or two fuscous transverse marks. Antennæ slender, as long as the body, black, fuscous beneath, the 3rd joint slightly shorter than 4th. Head slightly narrowed behind the eyes, broadly rounded in front, but retreating on the outer side of antennæ, and projecting, not sharply, between them ; frontal area well-marked, its lower end incurved at the centre, through the upper part of the large, distinct, oval, antennal fovea projecting into it ; furrows on vertex distinct, but not reaching to the back ; there is no central furrow. Clypeus with a shallow indentation. Cerci as long as the hinder spurs. Wings as in *miliaris*. Length, $2\frac{1}{2}$ —3 lines.

Of similar size and coloration (except that the black, or, rather, fuscous, markings on abdomen are confined to the base) to *miliaris* and *glutinosæ*, but it differs from both in having the head much more swollen in front, the part between the antennæ being rounded and not furrowed in the centre, the frontal area is less raised, and not truncated at the apex, the antennal fovea is very distinct, while the curved furrows which come down on either side of the antennal fovea, so conspicuous with *glutinosæ* and *miliaris*, are scarcely noticeable ; the cenchri are smaller, and the antennæ thinner.

The larva has the body dark green; the head is green; on its centre, in front, is a long black line which reaches near to the mouth; above, over the eyes, is a much shorter lateral line. Over the legs is a blackish waved line, and above that again is a less distinct line. On the thoracic segments are some tubercles, while over the anal segment is a black mark, cleft behind, where it is broader than it is at the apex; the cerci are black. A thin white line runs through the spiracles.

The larva of *salicivorus* may be known from that of *miliaris* by the much longer central stripe and broader lateral one on head; by the less clearly indicated black stripe on the sides of the body above, by the clearly indicated waved lines over the legs, by the legs wanting the oblique black mark in front of them found in *miliaris*, and by the distinct black mark over the anus. In habits they are identical, and they may be sometimes found feeding on the same sallow bush.

Clydesdale, Worcester.

5. *N. curtispina*, Thoms.

6. *N. palliatus*, Thoms.

7. *N. lacteus*, Thoms.

Glasgow: January, 1882.

DESCRIPTION OF THE LARVA, &c., OF *HYDRÆCIA NICTITANS*.

BY WILLIAM BUCKLER.

As I am not aware of any other than the very brief description of the larva of this species, from Treitschke, in Stainton's Manual, I am induced to offer one resulting from my own observations.

My first acquaintance with the larva was in August, 1862, when Mr. Hydes, of Sheffield, sent me six full-grown examples, reported to have fed on some kind of grass, but as I could not then obtain any more precise knowledge of their habits, I contented myself with a figure from one of them, and that figure soon proved very serviceable in protecting me from an error, when a flower-head of *Iris pseudacorus* with a larva of *nictitans* placed in it, was sent to me as that of *Apamea fibrosa*—a larva which in all the subsequent years has not yet been forthcoming!

However, sixteen years later by a mere chance I was able to improve my acquaintance with *nictitans*, for on 7th of June, 1878, I happened to pick up a small stone that rested on a very little tuft of *Poa maritima* in gravelly soil, near a salt watercourse, and found I had torn away with the stone a silken covering from a very young *Noctua* larva, apparently unknown to me, which I brought home as a prize to be carefully tended, watched, and figured; it soon moulted,

and my interest in it increasing, I again visited the spot in about a week when I found three rather larger examples, and again two more of them on the 20th of June while getting fresh tufts of the food-plant, and in the same way subsequently two others; the larvæ when found varied in length from a quarter of an inch to an inch, and then only when approaching their last moult could I suspect what species they were, though when they neared full growth my previous suspicion ripened into certainty of their identity, which in August following was confirmed when I bred the eight moths, comprising the usual sexual varieties of colouring, from the 4th to 20th of the month.

The habit of this larva is to feed on the bleached portions of the grass close to the soil, and to spin for itself there a case of whitish silk closely and firmly invested with the food-plant which forms at once a snug dwelling and protection, and in most instances the shelter afforded by a stone was utilized, even within a few inches of salt water; it rather surprised me to find this species in such a littoral habitat, never having met with it before, though I had known the moth taken at light in a grassy place bordering a wood four miles away inland, and understood that it occurred commonly on open moors and other similar localities in many parts of the kingdom.

The young larva, when a quarter of an inch to three-eighths in length, is of ivory-whiteness striped longitudinally with purplish-crimson, the head white with black ocelli and dark brown mouth; after a moult in about five days later it assumes a little more colour, when the head is pale whity-brown as are also the neck and tail plates, each plate having two pairs of minute blackish-brown dots, the ground colour of the body is a faint greenish-drab, which shows transversely at the segmental divisions and in the wrinkles, as well as in the broadish dorsal stripe, the sub-dorsal and lateral stripes and the whole of the belly, the alternating dark stripes are now of crimson-brown, broadest along the back of which they mark the boundary, the two below on the side are narrower and follow the sub-dorsal and lateral ones, the spiracles occurring at the bottom of the lowest.

On attaining nearly the length of an inch, its stoutish form is noticeably stoutest at the third and fourth segments, the darker colouring of the back and side stripes is now changed to pinkish-grey, and that of the paler stripes to a light rather greenish flesh tint, the shining head is of a warm flesh colour and dark brownish at the mouth, the glossy neck-plate is light yellowish-brown rather inclining to orange, thinly outlined with blackish-brown, but thicker at the front margin, where it is wavy within; the anal plate is of the same colour

and similarly margined; the blackish-brown tubercular dots are very small along the back as far as the eleventh segment, then rather larger on the twelfth and front of the thirteenth; the black oval spiracles at the bottom of the lower grey side stripe are accompanied with blackish-brown spots peculiarly characteristic, viz.: one in front and one above of ordinary size, and a very large one behind the spiracle, and in corresponding position on the third, fourth and twelfth segments this is even larger still and somewhat trilobed in shape, two other rows of single spots smaller and paler occur below.

When full-grown the larva is about an inch and a quarter in length, rather broadest on the third and fourth segments, tapering thence a little to the head, also in a very slight degree towards the anal segment which is rounded off behind; the characteristic head plates, and spots remain as before, but the previous contrast of colours between the lighter side stripes and darker back is now greatly reduced, and the light broadish dorsal stripe also from its softened edges and showing faintly within a slightly deeper greyish pulsating vessel.

On entering the earth the larva encloses itself in an earthen cocoon of weak cohesion; the pupa varies from five-eighths to three-quarters of an inch in length, and is of stoutish proportion, of the usual *Noctua* form, the abdomen convexly tapering from the movable segments to the anal tip, which ends with two very fine projecting points; on the back of four of the middle abdominal rings just at the beginning of each is a narrow transverse band of punctate roughness, while all the other parts are smooth and shining, and the colour is of deep mahogany-brown.

Emsworth: *January 7th*, 1882.

ON FIVE NEW BRITISH *HYMENOPTERA*; WITH A SYNOPTICAL
TABLE OF THE GENUS *SPHECODES*.

BY EDWARD SAUNDERS, F.L.S.

Of the five species I am about to describe, two belong to the very difficult genus *Sphécodes*, and to show how they differ from their allies, I have given a table of all our British species, indicating the novelties by *n. sp.* after their names. I fear that in many collections the species in this genus are mixed, as it is only by very careful study of the genitalia in the ♂, and the apical segment in the ♀, and the alar hooks in both sexes, that they can be separated with any certainty. We are

indebted to both Von Hagens and G. C. Thomson for the careful structural study they have made of this genus, and I have borrowed largely from their remarks in the characters I have used.

SPHECODES.

- (4) 1. Posterior wings with 7—10 alar hooks; antennæ in ♂ long, 3rd joint not one-fourth so long as the 4th.
- (3) 2. Vertex of the head in both sexes with its sides converging rapidly behind the eyes. ♂ genitalia with the squama produced into a membranous wing on its inner margin, and terminating in two unequal processes densely clothed with long hairs, of which the upper process is much longer than the under, and is produced and widened at the apex, the widened apices crossing each other. ♀ with the apical dorsal valve narrow and linear GIBBUS.
- (2) 3. Vertex in both sexes usually more or less quadrate (though very variable in this respect). ♂ genitalia with the squama unwinged, and terminating in two sub-equal processes, sparingly clothed with short hairs. ♀ with the apical dorsal valve wide and flat SUBQUADRATUS.
- (1) 4. Posterior wings with 5—6 alar hooks; antennæ in ♂ short, 3rd joint much more than one-fourth the length of the 4th.
- (10) 5. Genitalia of the ♂ with the stipites not grooved; antennæ with the joints much produced and rounded in front. ♀ with the puncturation of the thorax large and close, 3rd segment of the abdomen without a lateral black spot or fovea.
- (9) 6. Surface of genitalia in ♂ longitudinally striate, 2nd sub-marginal cell longer than wide in both sexes.
- (8) 7. Larger; ♂ genitalia with the sagittæ very narrow, and fringed with short hairs, the squama membranous and somewhat quadrate, with a thickened semi-lunate central region. ♀ with the apical dorsal valve wide, slightly reflexed and shining at the edges PILIFRONS, Thoms.
= *rufiventris*, Sm., nec Wesm.
- (7) 8. Smaller; ♂ genitalia with the sagittæ much widened at the base, the squama produced into two processes, of which the under one is rather the longer. ♀ with the apical dorsal valve narrower, dull, and with an impression running parallel to its edge round its apex 1. SIMILIS, Wesm., *n. sp.*
Bull. Acad. Brux., 1835, T. ii, p. 279.
- (6) 9. Surface of genitalia in ♂ finely rugose, not longitudinally striate, 2nd sub-marginal cell, in both sexes, on its lower margin, as wide as long, narrowed above 2. PUNCTICEPS, Thoms., *n. sp.*
Op. Ent., 100, 8.
- (5) 10. Punctures of thorax fine and distant, genitalia of the ♂ with the stipites widely grooved. ♀ with the 3rd segment of the abdomen generally with a small black spot or fovea on each side near the base, apical dorsal valve narrow EPHIPIUM.

3. COLLETES PICISTIGMA, Thoms., Hym. Scand. ii, p. 165.

Like the other smaller species of the genus in general appearance, but the ♂ has the first abdominal band interrupted, the basal segment largely and closely punctured, and the sixth ventral segment shining, strongly punctured, and with a shallow fovea on each side near the apex; each segment beneath has also an entire fringe of short hairs, in this respect resembling *succincta* and *marginata*; but the former of these may be known by the two deep foveæ of the sixth ventral segment, and the latter by this segment being simple, with only a slightly raised dorsal line; the genitalia have the apical portion of the stipites about equal to the basal, the apical pencil of hairs reaching to about the end of the sagittæ; the sagittæ have their lateral membranous wings projecting beyond the end of the thicker portion, somewhat turned down at the apex and rounded.

The ♀ has the pubescence of the thorax rather of a brighter red than in its allies; the abdomen slightly shining, but with its basal segment largely and closely punctured; its best characteristic is that it lacks the long scattered hairs, which clothe the whole basal half of the first segment in *fodiens* and *succincta*, although the segment is clothed with short hairs at the sides and at the extreme base. The colour of the abdomen also is of a particularly deep black, and the bands whiter than in the other species.

I have taken the ♀ at Hastings, Falmouth, Hayling Island, Littlehampton, and Southwold. Mr. Bridgman has taken it at Norwich. The capture of the ♂ by Sir S. S. Saunders in Hampshire was recorded in our December number.

4. HALICTUS BREVICORNIS, Schk., Jahrb. Ver. Naturk. Nassau, xvi, 1861, p. 310.

This little species, of which I have at present only seen British specimens of the ♂, is very distinct, and, considering the difficulty of the genus, tolerably easy to recognise by the following characters:

♂. The antennæ are shorter than in most of the black species; the thorax is deeply punctured, the punctures being somewhat remote, *i. e.*, about the width of two punctures apart; the surface is shining, and nearly smooth; the punctures of the scutellum are rather larger and more remote; the metathorax is longitudinally rugose at the base, its brow somewhat rounded and smooth; the abdomen is short and oval, slightly shining, finely and clearly punctured on the first three segments; beneath there are a few rather short hairs; extreme base and apex of tibiæ, and the whole of the tarsi, pale.

♀. Head very finely and closely punctured; clypeus very largely and remotely,

fringed in front with long golden hairs, its apical margin truncate, and produced at each side into a triangular tooth: mesothorax finely and remotely punctured, in front with a deeply impressed central line: metathorax as in the ♂; abdomen with the first segment shining and scarcely punctured, the rest very finely and closely punctured, with the apical margins discoloured, clothed with ochreous-grey hairs; beneath with long fringes of grey hairs on each segment.

I have described the ♀ from a continental specimen, kindly sent to me by Mr. C. Ritsema. The ♂ I have taken at Hayling Island and Bournemouth, but only in single examples.

The only species it could be confounded with is *H. villosulus*, but its smaller size, finer puncturation, and shorter antennæ in the ♂, readily distinguish it.

5. *EPEOLUS PRODUCTUS*, Thoms., Opusc. Ent., p. 91, Hym. Scand., ii, p. 210.

♂ differs from that of *E. variegatus* in having the two tubercles of the labrum situated nearly across the middle, instead of considerably below the middle as in that species, and the apex of the labrum bi-dentate instead of simple, the second segment of the abdomen beneath more shining and more sparingly punctured, the apical dorsal valve widely rounded with parallel sides.

♀ differs from that of *E. variegatus* in having the labrum and the second abdominal segment as in the ♂, the intermediate and posterior femora black, except at the base, the second, third and fourth abdominal segments with a round dorsal spot on each side distinct from the extreme lateral spot, whereas in *variegatus* the two spots on the second segment are confluent, and those on the following segments not so round and more transverse. I do not, however, attach much importance to this character, although it is easily noticeable. The fifth segment beneath is much more narrowly rounded than in *variegatus*, and the posterior femora towards the base outwardly, more largely and rugosely punctured; in size it is generally rather larger than *variegatus*.

I have taken this species at Hayling Island and Littlehampton, and Mr. Bridgman has taken it at Norwich; in fact, it appears to be our common species. I have only taken *variegatus* at Falmouth, and seen a ♀ from Reigate, taken by Sir Sidney Saunders.

Holmesdale, Upper Tooting:

December 12th, 1881.

ANNOTATED LIST OF BRITISH *ANTHOMYIIDÆ*.

BY R. H. MEADE.

(continued from page 176.)

12. HOMALOMYIA, Bouché.

Gen. ch.—Head smooth and semi-circular; eyes large, covering the sides of the head; bare, and sub-contiguous or approximate, in the males; arista sub-pubescent or bare, with the second joint often rather elongated; aulets of moderate or small size, with the scales more or less unequal; abdomen mostly elliptical and flattened in the males, and marked with an angulated dorsal stripe; oval and immaculate in the females; wings with the anal vein shortened, and the axillary vein curved towards its extremity; legs with the middle tibiæ tuberculated, or thickened and ciliated, in the males.

Sect. 1—*Legs more or less pale.*

- | | | |
|---------------------------|--|----------------------|
| 1. APRICA, Hal. | \| | 2. FUSCULA, Fall. |
| <i>Passerinii</i> , Rond. | \| | 3. PALLITIBIÆ, Rond. |

Sect. 2—*Legs wholly or nearly black.*Div. i—*Halteres pale.*

- | | | |
|----------------------------------|--|---------------------------|
| 4. SCALARIS, Fab. | \| | 10. HERNIOSA, Rond. |
| <i>saltatrix</i> , Desv. | \| | 11. MUTICA, Zett. |
| 5. CANICULARIS, Lin. | \| | <i>lepida</i> ?, Wdm. |
| <i>M. domestica minor</i> , Deg. | \| | 12. SOCIELLA, Zett, |
| 6. INCISURATA, Zett. | \| | 13. SERENA, Fall. |
| 7. MANICATA, Meig. | \| | <i>lugubrina</i> ?, Zett. |
| <i>peniculata</i> ?, Rond. | \| | 14. FLORICOLA, Meig. |
| 8. ARMATA, Meig. | \| | <i>cilicrura</i> , Rond. |
| 9. SPISSATA, <i>sp. n.</i> | \| |  |
| <i>armata</i> ?, Macq. | \| |  |

Div. ii—*Halteres black.*

15. CARBONARIA, Rond.
 ærea?, Meig.

This is one of the best defined and most natural groups among the *Anthomyiidae*. It includes the *Chorellia* of R. Desvoidy, so named from the habit of the males to perform choral dances in the air. The peculiar structure of the last two longitudinal veins of the wing (see fig.*) is common to this and the three following allied genera, viz., *Cœlomyia*, Haliday, *Piezura*, Rondani, and *Azelia*, Desvoidy.

* Wing of *H. aprica*.

H. APRICA, Hal.

This fine species is the largest and most highly developed in the genus. The middle and the posterior legs have the femora and tibiæ of a bright reddish-yellow colour in both sexes. The front pair have the femora and tibiæ dusky in the males. The females have the coxæ yellow, and also the anterior femora and tibiæ in many specimens; but sometimes they are darkened, as in the males. The abdomen is sometimes grey in both sexes, and sometimes partly yellow and translucent. It is generally distributed but not common. The females are more frequently seen than the males.

*H. FUSCULA*, Fall.

Of this rather peculiar and well-marked species, which has the tibiæ reddish or piceous, I have only seen a single female, which I captured near Edinburgh in August, 1875. The best description is given by Zetterstedt, in the *Diptera* of Scandinavia. He notices the male in the 4th vol., p. 1686, and, in vol. 8, p. 3310, gives a correct account of the female, which has the frontal space comparatively narrow. He says that both sexes of this fly were found by Stæger in the nest of a humble bee. The specimen which I found was covered by a number of *Acari*, similar to those which infest bees and beetles, so perhaps it had been in a bees' nest.

H. PALLITIBIÆ, Rond.

This small species has the knees and tibiæ pale, in both sexes. It appears to be rare; I have one pair (♂ & ♀) captured in the neighbourhood of Bradford.

H. SCALARIS, Fab.

This common species, characterized by the projecting tubercle on the inner sides of the middle tibiæ of the males, sometimes has the anterior tibiæ yellow at their bases, when it forms the *A. manicata* of Macquart (not of Meigen). I have a variety in which the second and third abdominal segments are yellow and translucent at their sides, as in *H. canicularis*; this is probably the same as the *A. subpellucens*, Zett.

H. CANICULARIS, Lin.

This, though the best known and the most common species, and the one which is generally considered as the type of the genus, really possesses fewer characteristic features than most of the others; the eyes being proportionately smaller, covering less of the cheeks, and the middle tibiæ being simple, without any tubercle or marked thickening.

H. INCISURATA, Zett.

This species bears a very close general resemblance to *H. scalaris*, in size, shape and design; it differs, however, by having the thorax grey, not black, marked by two or more less distinct stripes, and by the intermediate tibiæ being simple, as in *H. canicularis*. Rondani does not seem to have known this species, for he confuses it with *H. lepida*, Wdm., which appears to me to be synonymous with *H. mutica*,

Zett. The females of *H. incisurata* and *H. scalaris* are very similar, but may be distinguished by the neuration of the wings, the third and fourth longitudinal converging a little in the latter, and being almost parallel in the former species. It is not very common, but generally distributed.

H. MANICATA, Meig.

The males of this pretty species are characterized by having the anterior knees pale, and also the fore tibiæ, with the exception of their apices, which are black, thickened, and furnished on their outer sides with a little tuft of black hairs, which is sometimes adpressed so as to be easily overlooked; a long straight spine also projects downwards from the base of each middle coxa. The females may be distinguished by the pale colour of the fore tibiæ. Not common.

H. ARMATA, Meig.

This little species differs from most of the others by having the abdomen wide and less elongated. Meigen's description is very correct, but he omits to mention that the posterior tibiæ are curved as well as thickened, and ciliated with longish hairs on both sides. The females of this and many other species of *Homaloymia* are very difficult to determine, unless they are captured together with the males. Generally distributed.

H. SPISSATA, sp. n.

Mas, niger nitidus, abdomine oblongo depresso glauco, linea dorsali angulata ornato; femora intermedia subtus hispida; tibiæ intermediæ nudæ abruptè spissatæ; tibiæ posticæ intus ciliatæ. Long. $2\frac{1}{4}$ lin.

Head: eyes sub-contiguous; arista bare.

Thorax, with the scutellum, black, shining, and unstriped.

Abdomen oblong and depressed, grey with glistening white reflections when viewed from behind, and appearing of a brownish-black colour when seen from before. It is marked by an interrupted dorsal band, which is dilated at the base of each segment into a triangular spot; anal processes very small.

Wings slightly nigescent, third and fourth longitudinal veins parallel; external transverse vein nearly straight and upright, separated from the internal transverse vein by about twice the distance that it is from the termination of the fifth longitudinal.

Scales of *Calyptra* of moderate size and unequal length, and of a sordid white or brownish colour. *Halteres* yellow. *Legs* black, with the exception of the bases of the anterior tibiæ, which are testaceous; front pair simple; middle femora furnished beneath with longish black bristles, not extending to the apex, and arranged in two parallel rows; coxæ without spines; middle tibiæ abruptly thickened or tuberculated on their inner sides at about one-third from the lower end; tubercle smooth, not ciliated; posterior tibiæ slightly curved, somewhat thickened, furnished with a few long hairs in the middle of their inner surfaces, and with a number of bristles and hairs of irregular lengths on their outer sides.

This is possibly the *H. armata* of Macquart; it differs from *H. armata* of Meigen, and also from *H. manicata* of Meigen, by having the tubercular projection on the middle tibiæ smooth and not bearded with short hairs as in both those species.

The tubercle resembles that of *H. scalaris* in being smooth, but is proportionately smaller and less prominent.

I captured a single male of this rare species at Tingewick, near Buckingham, in August, 1873.

H. HERNIOSA, Rond.

This differs from all the other species in the genus by the males having a large projecting sub-anal process. The abdomen is black with grey reflections, but without any distinct dorsal stripe. The wings are slightly fuscous, and have the anal veins rather more elongated than usual, with the axillary veins straighter and placed almost parallel with the anal. It is rather an aberrant species, and appears to be rare; I have only seen three specimens, all captured in the neighbourhood of Bradford.

H. MUTICA, Zett.

This species is probably the same as the *H. lepida* of Wiedemann and others (not of Zetterstedt), and the *H. prostata* of Rossi and Rondani; but the descriptions given of these species are not sufficiently precise to enable one to determine the point with accuracy, and it is very likely that more than one distinct species have been mixed together under the name of *H. lepida*. For these reasons I have adopted the title of *mutica*, as the description given of that species by Zetterstedt agrees with the characters of the fly which I wish to discriminate. It is from 2 to 2½ lines in length; the calyptra have the scales of moderate size, and of marked inequality; the thorax is black; the abdomen grey, with brownish-black reflections, and the usual angulated black dorsal stripe; the intermediate tibiæ are gradually (not abruptly, as in *H. armata*) thickened towards their extremities, and ciliated with very short hairs on the inner sides of the thickened parts; the posterior tibiæ are slightly curved inwards, ciliated along the whole of their external surfaces with a row of hairs of moderate and even lengths; and have on their inner sides some long hairs in the middle, and others which become shorter towards each extremity; the wings are slightly fuscous. It is not uncommon.

H. SOCIELLA, Zett.

This is a well-marked species, of about the same size as the last. The thorax has a grey tinge, the shoulders being whitish; the abdomen is ash-grey, marked by a narrow black sub-interrupted dorsal stripe, with very indistinct or no angular dilations; the intermediate legs have the femora ciliated with long hairs of even lengths along their posterior surfaces, and are furnished with a long row of spines on their under sides; the middle tibiæ have yellow bases, are very slightly thickened towards their extremities, and ciliated with soft short hairs along the whole length of their inner surfaces; the posterior tibiæ are simple, having no bristles or long hairs on their sides, with the exception of the two or three usual spines on their outer surfaces. A rare species. I only possess a single male, captured near Bicester, Oxon.

H. SERENA, Fall.

This is a small species, only from 1½ to 2 lines in length; the calyptra are small, with scales almost equal in size; the wings have a brownish tinge; the abdomen is narrow, and often with a reddish or yellowish tinge, and somewhat translucent

at the base ; it is marked by the usual angular stripe (as in *H. scalaris*) ; the legs are often piceous ; the middle femora are ciliated beneath with long hairs, the middle tibiæ are thickened along their lower halves, and ciliated nearly the whole length of their inner sides, the hairs becoming longer towards the apices ; the posterior tibiæ have a few long hairs of irregular lengths on their outer sides, and only the usual short adpressed ones on their inner surfaces ; the poisers and scales are sometimes fuscous. Not very common.

H. FLORICOLA, Meig.

This species may be readily known by its brownish wings, and widish, straight, interrupted dorsal band on the abdomen, having no angular dilatations. The tibiæ, especially the posterior ones, are piceous or sub-rufous ; and there are six strong projecting spines on the infra-thoracic surface, one arising from the base of each coxa. Not uncommon.

H. CARBONARIA, Rond.

This little black species is well marked, and generally distributed ; the calyptra are small, and, with the halteres, black ; the wings are fuscous ; the abdomen is short and wide, flattened, and marked with the usual angulated dorsal stripe ; the middle tibiæ are thickened towards their ends, which are shortly ciliated on the inner sides ; the posterior tibiæ are unarmed ; there is a minute black spur or tooth-like process on the under-side of each middle metatarsus at its base ; a similar but larger process is found in the same situation in *H. armata* ; on close inspection with a good lens, this is apparently formed by a pencil of rigid black hairs. I believe this species to be identical with the *A. ærea* of Meigen, but not with that of Zetterstedt ; the latter is considered by Loew to be the same as the *A. gibbera* of Meigen, and to belong to the genus *Azelia*.

(To be continued).

MEASUREMENTS IN DESCRIPTIVE ENTOMOLOGY ; A SUGGESTION.

BY R. McLACHLAN, F.R.S., &c.

The following remarks *now* almost exclusively concern British entomologists. Very few years ago they might have been applied far more universally. The substance of them amounts to a suggestion that *millimètres*, and not *inches and lines*, nor *inches and fractions*, should be used in all descriptions ; in effect the decimal system should be accepted.

At the present moment, there may be considered to be no existing "custom" amongst British entomologists, but many of them have anticipated my suggestion by rendering it inapplicable to themselves. In the volume of "Transactions" of the Entomological Society of London for 1881, I find "descriptive" papers from the pens of sixteen authors, ten of whom use "inches" or "lines" (or fractions), while six use "millimètres." And more than the "thin end of the

wedge " has been inserted, for it was only quite recently that "millimètres" were used at all, excepting in quotations.

Carrying my analysis *outside* the entomological publications of this country, I scarcely find (excepting in some issued in the British Colonies) any system of measurement employed other than by millimètres.

The old descriptive authors (commencing with Linné) did not, as a rule, think it necessary to indicate any dimensions other than comparative, thus arguing that their readers should possess at least *as much* knowledge as they. Later, a system of measurement by "inches" and "lines" was instituted, and outside this country this was usually based upon the "Paris inch" (*cf.* Burmeister's "Manual," English translation, p. 26), but not universally, for there were "inches" other than Parisian (excluding our own). The "Paris inch" (which was divided into 12 "lines," as is our own) equalled about $1\frac{1}{3}$ th English (*i. e.*, about 1 inch, $1\frac{1}{2}$ lines), and, occasionally, the "Paris inch" and decimals were employed. Until quite recently (as already demonstrated), English authors used the English inch and lines (or fractions) exclusively. When we consider that the old "Paris inch" equalled about 28 millimètres, and that the English inch measures slightly over 25 millimètres, it is easy to imagine that much confusion and error resulted from this employment of a term which had such a striking discrepancy in its possible interpretation according to the nationality of the describer. This discrepancy may appear small to the general travelling public whose ideas have been "enlarged" when trying to equalize an English and German "mile," but it seriously affects entomologists who occupy themselves with the study of minute insects, or of the comparative lengths of the parts of an insect. The use of the English "inch" is liable to more than double the chance of error than if millimètres had been employed to give effect to the author's meaning. (Occasionally, authors have used centimètres and millimètres, or fractions of a centimètre, the latter course being especially objectionable).

Measurement by lines (whether "Parisian" or English) fails in minute insects. It is not, therefore, necessary to enlarge on the custom universal with investigators of minute forms of animal (or vegetable) life, to whom the microscope (with powerful objectives) and micrometer are absolute necessities; these use the decimal system; no other would avail. With these it is often necessary to carry the decimal system to extreme minuteness; for all practical purposes in entomological descriptions (concerning external anatomy only) the millimètre (with large fractions) is sufficient.

To conclude. The "descriptive entomologists" of Britain (and her Colonies) are now nearly equally divided between those who use the English inch (and divisions) and those who employ millimètres. Those who still adhere to the former system of measurement isolate themselves from (and occasion unnecessary trouble to) their brethren of nearly all other nationalities. In addition to this they sometimes inadvertently introduce an item of uncertainty into their descriptions which might be reduced to a practical minimum by the employment of *millimètres*. When Teuton, Gaul, Sclav, and "our American Cousin," are approximately agreed on a certain course as best suited to the advancement of science, we "Britishers" should not be divided as to its importance.

Lewisham, London: 9th January, 1882.

AN ANNOUNCEMENT OF NEW GENERA OF THE *EPHEMERIDÆ*.

BY THE REV. A. E. EATON, M.A.

(*Supplementary from p. 27*).

Amongst specimens of foreign *Ephemeridæ*, very kindly lent me by Dr. Hagen, are represented the following new genera:

HAGENULUS, *n. g.*

Allied to *Adenophlebia* (Ent. Mo. Mag., xvii, 194), but differing as follows:—Hind-leg scarcely longer than the intermediate-leg, their unguis dissimilar in form and size; fore tibia of ♂ about twice and a half as long as the femur. The first axillary nervure of the fore-wing, instead of the anal nervure, receives the extra longitudinal nervures interpolated between them. Hind-wing with a large unciform costal projection, and with very simple neuration. Egg-valve about as long as the last three abdominal segments taken together, narrowed from its base to about its middle, and from thence to its apex, forming a split tube, through which the eggs are discharged; ventral membranous projection of the ♀ penultimate segment acutely excised and bifid. Type, *H. caligatus*, (in *Potamanthus*), Hag., MS., from Cuba.

Hagenulus caligatus, *n. sp.*

Potamanthus caligatus (Hag., MS.).

Sub-imago dried. ♂. Wings transparent pale bistre-grey: neuration slightly opaque, some of the cross-veinlets in the first three areas of the fore-wing marked with black, most of the others in the disc of the wing faintly bordered with greyish; in ♂ seven cross-veinlets in the marginal area before the nodal point. Setæ annulated with black.

Imago [in life, has olive-brown oculi, light brown ochreous body, with a small black or brown spot on each side of every abdominal segment, &c.: *teste* Gundlach,

Hag., MS.], ♀, dried. Thorax above, luteo-fuscous; abdomen discoloured, the segments darker posteriorly, the venter paler than the dorsum. Wings transparent, the marginal area of the fore-wing slightly discoloured, and containing about seven simple cross-veinlets before, and eleven beyond, the nodal point: neuration piceous, nearly every cross-veinlet marked with a roundish blackened spot. Legs dull pale brownish-yellow, each with the femur twice banded with piceous, the distal extremity of the tibia black, and the tarsus sub-lutescent ["with darker tip to the tarsus," Gundl., MS.]. Setæ white, or greyish-white, with black annulations and joinings; the annulations towards the base of the setæ at every joint, then at every alternate joint, and, still further from the base, at every third joint. Long. corp., 5·—7·5; al., 7·5—8·; setæ circiter, 10 mm.

Hab.: Rangel Mountains, Cuba, in June (Poëy, Chas. Wright and Gundlach; Hag. Mus.). There is no ♂ im. in the collection, but only a sub-imago with seven cross veinlets in the marginal area of the fore-wing before the nodal point; but there are four ♂ im. of, perhaps, another species which have none there, and only nine in the pterostigmatic space. Their thorax seems to be piceous, and their wings are spotless.

TELOGANODES, *n. g.*

Allied to *Ephemerella*, having the anal nervure of the fore-wing similarly approximated to the 1st axillary nervure towards the wing-roots (*vide* Trans. Ent. Soc. Lond., 1871, pl. ii, 5), but differing, as follows:—Hind-wing obovate-oblong, sub-similar in outline to that of *Habrophlebia* (*vide op. cit.*, pl. v, 2), but more obtuse: neuration extremely simple, comprising three longitudinal nervures, viz.: a strong sub-costa terminating near the extremity of the costal projection, followed by a forked and a simple nervure comparable with the 2nd and 3rd nervures in the hind-wing of *Bætis pumilus* (*op. cit.*, pl. v, 25a). Two caudal setæ. Type, *T. tristis*, (in *Cloë*), Hag. Distrib., Ceylon.

LEPTOHYPHES, *n. g.*

Allied to *Tricorythus*, but differing as follows:—Caudal setæ, 2. Wings with more numerous cross-veinlets in the disc (none in the marginal area), and having the recurrent membrane produced (as in *Oligoneuria*, &c.) into a short, free, subulate prolongation at the peak of the mesonotum; the terminal and inner margins, perhaps, fringeless.

Leptohyphes eximius, *n. sp.*

Adult ♀ dried. Body discoloured, pitch-black. Wings transparent, talcose, or slightly dimmed with very pale sepia-greyish; neuration pitch-brown. Fore-legs greyish-black; hinder femora greyish-black, hinder tibiæ and tarsi greyish-white. Setæ dull whitish. Long. corp. (shrunken), 4; al., 8, setæ circiter, 8 mm.

Hab.: Cordova, Argentine Republic.

Croydon: 10th January, 1882.

Notes on Lepidoptera in Roxburghshire in 1881.—I have made a few notes on some species of *Lepidoptera* which I have taken, and larvæ I have reared to pupæ, this summer, which may be of some interest to record. During the months of June and July there were extraordinary numbers of the common *Noctua*, the sugared trees on some nights being perfectly covered with them; the species in greatest force being *Apamea basilinea*, *Xylophasia rurea*, *Hadena thalassina* and *adusta*, *Noctua c-nigrum*, and many others. The autumn, however, owing to continued cold and wet, has been very unproductive, and many species commonly seen have been meagrely represented, and of others I have scarcely seen a specimen. I may mention that any of the species I have to note of which I had any doubt as to identity have been seen (including all four specimens of *Triphæna subsequa*) and confirmed by Mr. C. G. Barrett, and so may be relied upon. I have seen little of the group of *Sphingina*, and can only note two species, viz.: a fine, newly-emerged specimen of the common *Smerinthus populi*, found clinging to a flower-stem in June; and, on August 24th, a friend sent to me a fine, large, live specimen of *Sphinx convolvuli*, which he found clinging to the outside sash of a window—it is a very large specimen, measuring five inches across the wings, when set out in the usual English fashion. The larva of *Smerinthus populi* is very common on every species of *Salix* and *Populus* in this district, and I have reared a rather large number successfully. Of the *Notodontidæ* I have succeeded with the following, viz.: *Cerura furcula*, which seems scarce; *Notodonta ziczac* and *dromedarius* are both moderately common (I have twenty-eight pupæ of the latter, and about as many of the former) and generally distributed. I may mention that I found one larva of *dromedarius* on alder almost saffron-yellow in colour, and it remains to be seen whether or not the imago will show any variation from the usual type. *Leiocampa dictæa* is pretty common on poplar, but *dictæoides* is a scarce species; I got a few of the larvæ on birch, all of which pupated successfully; in colour they were of a uniform, purple, shining brown, the raised lateral yellow lines being broad and very conspicuous. *Lophopteryx camelina* is plentiful on willow, oak, and birch, the two former apparently being preferred. I also took larvæ of *Clostera reclusa*, which seems very scarce. I got a number of the larvæ of *Bombyx quercus*, var. *callunæ* on heath, and was successful with them, having fourteen cocoons from eighteen larvæ. In the imago state, I took *Cilix spinula*, in fine condition, in July. Of *Noctua*, *Thyatira batis*, not seen previously here, and a number of fine specimens of *Acronycta ligustri*. *Leucania lithargyria* and *comma* were both moderately common, and *Nonagria fulva* plentiful, in September. Of the genus *Triphæna*, I took four specimens of *subsequa* in July, also a fine specimen of *fimbria* in August, and another in September. *Noctua augur*, although not considered a scarce species, appears to be so here, as I only took one good specimen. *Noctua c-nigrum* was plentiful throughout June and July; *triangulum* is scarce, and I secured two good specimens only, and one or two others in worn condition; *brunnea* and *rubi* are both common. Of the *Tæniocampæ* I took two specimens of *gracilis*, on willow bloom, in the beginning of May, and several good specimens of *Aplecta herbida*, from sugared trees, in June and July, and in the former month a fine specimen of *Hadena rectilinea*. *Anarta myrtilli* was unusually plentiful. I took of the *Plusiidæ* only one notable species, viz.: *Plusia festucae*, on July 13th, which seems very early for its appearance. Of *Geo-*

metræ I got, in September, three specimens of *Ennomos tiliaria*, and one of *Himera pennaria*; and, in July, several fine specimens of *Venusia cambrica*; *Macaria liturata* was moderately common in the fir-woods, and the males of *Fidonia pinaria* were in great force, the female not so easily found, although I secured several. I took *Scodiona belgiana*, on moorland, in fine condition, in June. *Anisopteryx æscularia* and *Larentia multistrigaria* were not common, although I got of each several good specimens. Of the *Eupitheciæ*, among others, *subfulvata* and *absynthiata*; and the following *Micro-Lepidoptera*, viz.: *Simaethis pariana*, *Eudorea cratægalis*, *Tortrix Forsterana*, *Peronea variegana*, *mixtana*, and *ferrugana*, *Teras caudana*, *Sciaphila virgaureana*, *Phoxopteryx unguicella* and *myrtillana*, *Eupæcilia angustana* and *ciliella*, *Depressaria nervosa*, *Cerostoma vittella*, *Plutella Dalella*, *Tinea semifulvella* and *cloacella*, *Swammerdamia comptella*, *Chauliodus chærophyllellus*, *Nemophora Schwarziella*, *Gracilaria Swederella*, and *Elachista apicipunctella*.—A. ELLIOT, Samieston, Jedburgh, N.B.: November 23rd, 1881.

[Mr. Elliot asks me to add to his communication a few words on several interesting species, which he has not mentioned:—*Hepialus velleda*, var. *carnus*, one very beautiful specimen. *Oporabia autumnaria*, several fine and well-marked specimens, with fore-wings certainly more triangular than those of *O. dilutata* or *fligrammaria*; these I understand were taken on a heath, higher than the locality in which Mr. Elliot found *fligrammaria* among sallow. *Cheimatobia boreata*, very fine specimens, having the marginal black dots distinctly shown on fore- and hind-wings. I may also mention that the four *Triphæna subsequa*, taken in Roxburghshire, have very much darker fore-wings than any I have before seen. They contrast handsomely with Suffolk specimens.—CHAS. G. BARRETT.]

Scarcity of Colias Edusa in 1881.—This does not appear to have been a "year" for this species, if one may judge from the absence of notices of captures in the Entomological periodicals; nor was it plentiful last year, or the year before. I have seen but one example myself this season, and that a large and very brightly coloured female which I captured at Penzance, while she was depositing eggs on some *Lotus* plants. She was at once placed in a breeding cage, with a growing plant of *Lotus*, and furnished with a piece of sponge moistened in syrup, and in about a fortnight's time laid some 150 eggs. A few of these were sent to my friend Mr. G. C. Bignell, of Plymouth, and the remainder, in due course, hatched. The young larvæ grew very well, and looked in a most satisfactory condition until just attaining their last moult, when nearly all of them sickened, turned black, and perished, and only about a dozen of them assumed the pupa state, and these also, in a short time, turned black and shrivelled up, although the wing cases of a few of them became of a bright yellow, showing that the perfect insect was fully developed and ready to emerge. I account for my failure in bringing these larvæ to maturity to want of sufficient sun, and the abundance of rain, during the whole time they were feeding, for they were kept quite exposed in my garden, and often for days at a time their food plants were saturated with moisture. Mr. Bignell fared no better with the eggs I sent him.—GEORGE F. MATHEW, H.M.S. "Espiegle," Funchal, Madeira: 13th December, 1881.

Smerinthus populi and *Notodonta dictæa* double-brooded.—Notwithstanding the unusually cold wet season—for, with the exception of a few weeks at the end of June and beginning of July we had, in the North of Devon, very little of what could be called real warm summer weather—these species were double-brooded. Larvæ of the former were observed the middle of July, and again up to the second week in October, and this latter brood were nearly all the beautiful golden-green variety with sub-dorsal row of large red spots, rarely to be seen among the first brood. Larva of *N. dictæa* also occurred the end of July, and were taken again, quite small, on 3rd October, so that most of this brood must have perished, for the easterly and westerly gales of the middle of the month completely blackened and killed the few fresh leaves then remaining.—Id.

Nepticula agrimoniæ, Heyden, a species new to Britain.—In October and November, 1879, when searching for larvæ of *Nepticula aneofasciella* in one of our large Sussex Woodlands, I had the good luck to find in the leaflets of *Agrimonia eupatoria* the larvæ of a second species, which pupated in their mines and yielded the above *Nepticula* in the following spring. The larvæ are locally very plentiful, and 20—40 may often be found in a single leaf. They seem to prefer the radical and lower cauline leaves of those plants which are well sheltered by brambles, &c. Not being able to find any empty mines, I infer that there is only one brood in a year. I cannot end this note without thanking Mr. Stainton for kindly naming some specimens for me, and for referring me to the accounts of this species in the Entomologists' Annual (1868, p. 47 and 1874, p. 46) which I had overlooked.—W. H. BALLETT FLETCHER, 6, The Steyne, Worthing, Sussex: January, 1882.

[Von Heinemann remarks (Wiener entom. Monatschrift, 1862, p. 312), "that this species is readily distinguished from its allies by the form of the anterior wings, which appear of unusual breadth beyond the middle, by the longer cilia," so that from the costa to the anal angle is a greater distance than usual in this group. The male, as remarked by Von Heinemann, has the anterior wings "more grey than black." The general appearance is, however, much that of *Nep. angulifasciella*. The habit of pupating within the mine is, however, one that does not occur amongst any of the allied species, and a good character is thereby at once afforded. Von Heyden's notice in the Stettin. entom. Zeitung for 1861, gives the earliest name for this insect, *Nepticula agrimoniæ*.—H. T. S.]

Re-discovery of Anerastia Farrella.—In July last, I paid a visit one afternoon to some sand-hills on the northern coast of Norfolk, and after boxing several species, such as *Agrotis valligera* and *tritici*, *Crambus inquinatellus* and *Warringtonellus*, and *Anerastia lotella*, which were dislodged from the grass and other herbage growing there, I took seven specimens of a Lepidopteron somewhat resembling, as I then thought, *Anerastia lotella*, but smaller and more conspicuously marked. This, upon arriving home, I pronounced to be *A. Farrella*, but noting the rarity of the species I sent one a short time afterwards to Mr. C. G. Barrett, who has informed me that I had named the insect correctly. In the Norfolk list of *Lepidoptera*, compiled by Mr. Barrett and issued in 1874, is a remark on *A. Farrella* which I cannot do better

than quote here. "The original specimens of this species were taken by a Mr. Farr, who collected in Norfolk about 30 years ago. He went to London about 1844 and afterwards died; it is, therefore, impossible now to ascertain the exact locality of the specimens, but they appear to have been taken either near Yarmouth or Lowestoft. Probably the species is to be found on the sands of the Norfolk and Suffolk coasts."—EDWARD A. ATMORE, 8, Union Street, King's Lynn: December 13th, 1881.

Eulepia grammica.—This day I have had a pleasure I never expected, viz.: to pin in my cabinet a veritable British specimen of *E. grammica*. About two months ago I went over to Keighley in Yorkshire to see an old man that T. H. Allis used to call upon; his name is Jesse Miller, one of the older type of collectors, that collected for love, and unless Labrey or Allis called he had no correspondents, still less with any dealers. Well, Allis tried hard to get the *E. grammica*, but Jesse kept the moth. I asked him who took it, and he said that John Armstrong took it about 46 years ago, in Wharfedale, when shaking the boughs of trees for caterpillars. I now copy from his letter to-day—"you need have no fear of its being British, it is the only one of the kind I ever saw." I may add, the specimen is old and perfect but badly set, and much smaller and duller looking than any foreign specimens I have seen; it is a male.—J. B. HODGKINSON, 15, Spring Bank, Preston: Jan. 4th, 1882.

Mimæseoptilus Hodgkinsoni versus *Loewii*.—I see my "plume" is threatened with extinction. Has any one seen the original *Hodgkinsoni* that I took? I fancy C. S. Gregson could give a good account of it, he has a good drawing of it and I rather think a specimen; the late Henry Doubleday wrote to me that I had sent him a new plume and a new *Tortrix*, the "plume" was *Hodgkinsoni*, the *Tortrix*, *Euchromia rufana*. A little more information may not be out of place. I never either saw or heard tell of a *Loewii* being taken any nearer than Southport, quite 50 miles away and a sea between; another thing the plant Centaury does not occur within miles of where I took this insect.—ID.

Amblyptilia punctidactyla.—This plume I took some years ago in the autumn, in the Clee Hill district of Shropshire, on the wing, and bred two specimens from larvæ sent me by a friend, found in the same locality, but a different part of it. The larvæ were feeding on *Stachys sylvatica*, and the pupa remained suspended to the spike on which the larva had fed; on finding, subsequently, in this county, larvæ that appeared precisely similar feeding on the same plant, and eventually suspending themselves in the same way, I hoped that I had reared a good series of the same plume, but they all, without exception, turned out to be *A. acanthodactyla*. The larvæ and pupæ were so similar that the characteristic difference must be very slight: both were green, with a slight purplish tinge in some, both slightly hairy. My friend has since taken and reared larvæ from the same plant in Dorsetshire, which have produced *punctidactyla*. From this, I judge that *A. punctidactyla* is often overlooked, and mistaken for *acanthodactyla*, and that it is worth while in the coming season to examine more closely the plume larvæ feeding on this plant, with a view to clear, if possible, these two plumes from confusion. *Acanthodactyla* is

common in this county, but I have never yet seen the other species here.—H. WILLIAMS, Croxton, Norfolk: *January, 1882.*

[We learn from Professor Frey's remarks, Stettin. ent. Zeitung, 1871, p. 125, that he had also bred both these plumes from *Stachys sylvatica*, but those he referred to *cosmodactyla* differed somewhat from the ordinary form of that species, such as he had been in the habit of breeding from the seeds of columbine (*Aquilegia vulgaris*). However, he could only look upon these specimens as being a variety of *cosmodactyla*, having once bred one similar specimen from columbine, amongst a hundred of the ordinary insect.

As the fifteen bred from *Stachys sylvatica* were all precisely similar, he suggested that they might bear the name of *cosmodactyla*, var. *stachydalis*. The *punctidactyla* of the Manual is the *cosmodactyla* of Frey and Staudinger.—H. T. S.]

Oxytelus fulvipes in Warwickshire.—Whilst searching to-day for *Ocyusa picina* and *Gymnusa variegata* (both of which species I obtained) in some boggy ground at Sutton Park, near here, I found several specimens of *Oxytelus fulvipes*, a species hitherto found only (in this country), I believe, in Needwood Forest.—W. G. BLATCH, 214, Green Lane, Smallheath, near Birmingham: *January 18th, 1882.*

Influence of size of elytra on flight in beetles.—In last November's Magazine, p. 138, are some notes of mine on the influence of air-currents on *Coleoptera*, and into these notes the Editors have introduced the following paragraph:—"It would, however, be difficult to base any general theory upon these facts, as so many mountain species have very abbreviated elytra and no wings at all, and such wet-loving sluggish creatures as *Aerognatha* have short elytra utterly disproportionate to the length of their body."

Now I should class *Aerognatha* with the *Bledii* and *Trogophlæi* mentioned in my note, for it has ample wings and on still evenings doubtless flies. But had it ample elytra the least breeze or air-current would waft it away from the subaquatic areas essential for it. I do not know to what genera the "many mountain species" with abbreviated elytra and no wings belong. Yet I can imagine species in which the shortened wing case, owing to a perpetually disturbed atmosphere, would be insufficient to enable them to retain their location, and in this case they might either die out or become apterous. It is possible even that a further modification would occur, viz.: the elytra might become soldered together as an insect ceases to raise them. Mr. Wollaston many years since referred the apterous forms of *Coleoptera*, so abundant in Maderia, to the strong breezes continually passing over that group of Islands, and what I believe is that the shortened wing cases of *Coleoptera* is a protection in a less disturbed atmosphere, namely, in the ordinary air-currents of temperate latitudes. For the past two weeks I have been noticing the flight of *Coleoptera* here, and comparing the movements of insects with those of Japan. In beating for specimens you knock numbers into the umbrella, but the difficulty is to secure them. Ordinary beetles, such as *Hispa*, *Languria*, and *Opilus* which are sluggish species in Japan, here often escape by flight before you can put a finger on them, and this activity I believe can be referred to the calm and generally currentless atmosphere of the tropics, which enables species with ample elytra to acquire a rapid and

energetic flight without being involuntarily carried away from their food-plants, or the situations suited for their habits. Now if there is truth in these latter remarks, *Brachelytra* should be much rarer in the stillness of the tropics than in the more disturbed atmospheres of the temperate regions, and I think my collections here will prove this.—G. LEWIS, Hadley, Dickoya, Ceylon : 12th December, 1881.

Capture of Cassida vittata near Hastings.—During last summer I captured this species along the road from Battle to Robertsbridge, and I thought it might be worth recording in your Magazine.—F. W. SAVAGE, University School, Hastings : January, 1882.

More Tropical Notes.—I have read Mr. W. B. Pryer's "Tropical Notes" (Ent. Mo. Mag., vol. xvii, p. 241) with great interest, and though I agree with him that on the whole the accounts of the fauna and flora of the Tropics are greatly exaggerated by travellers, still my experience in the Western Tropics, in Chiriqui and other parts of central America, differ greatly from those of Mr. Pryer in the East ; I do not find such an absence of life even in the dense forest, nor can I say that butterflies in particular are never found under the forest canopy. Mr. Pryer (who tells us very little about the *Coleoptera*) gives a somewhat dismal account of the productions of the forest which will certainly not apply to this part of the New World. The forests of the tierra caliente of Central America are perhaps more open than in Borneo, lofty trees with dense undergrowth of palms, tree ferns, &c., and though beautiful flowers are few and far between, still the foliage-plants in a great measure compensate for their absence. I seldom enter the forest without meeting with a flock or two of one or more species of monkeys, macaws, and other brightly coloured birds, two species of *Morpho*, two of *Caligo*, many *Heliconidæ* (the beautiful transparent winged *Ithomiæ* especially), species of *Satyridæ* that I never find excepting beneath the forest canopy, various *Erycinidæ*, &c. ; it is true that more species of butterflies will be found outside the virgin forest, in the second growth and along the banks of the rivers, &c., as the *Papilionidæ*, *Pieridæ*, *Hesperidæ*, species of *Anartia*, *Junonia*, *Danais*, *Agraulis*, *Callicore*, &c., these are rarely if ever to be seen in the forest. *Coleoptera*, however, are very rare comparatively in the forests of the hot country, the coffee-regions or zone of 2000—3000 ft. or more elevation is infinitely more productive ; I find at least double the number of species and individuals in those districts, and the new clearings made in the forests for planting coffee are the most productive places, here *Coleoptera* (especially small species) abound, many species of *Lebiidæ*, *Lampyridæ*, *Lycidæ*, *Longicorns*, *Chrysomelidæ*, *Hispidæ*, &c. *Hemiptera*, especially the *Pentatomidæ*, *Coreidæ*, and *Fulgoridæ* are perhaps commoner in the forests of the hot country. Though one does not find in this Western Tropical forest all the gaily coloured birds, insects, &c. at once, still they are there, and, in a residence of a few months, one becomes acquainted with them. I confess myself I was greatly disappointed with my first impression of the Tropical Forest, but, after a long residence, my opinion has greatly changed, and I can confirm Mr. Pryer's eastern experiences in one thing only, that is in the absence of flowers.—GEO. C. CHAMPION, Bugafita, Chiriqui, Estado de Panamá, U. S. Colombia : December, 1881.

Review.

LES CYNIPIDES, 1re partie.—La génération alternante chez les Cynipides par Dr. H. Adler, de Schleswig, traduit et annoté par J. Lichtenstein (de Montpellier) : suivi de la Classification des Cynipides d'après le Dr. G. Mayr, de Vienne. Montpellier ; C. Coulet : Paris ; J. B. Baillière et fils : Bordeaux ; Feret et fils : Berlin ; R. Friedländer et fils. 1881 : pp. i—xv and 1—141 : 8vo, with 2 coloured plates.

Dr. Adler's well-known theory of the alternation of generation in *Cynipidæ* is of extreme interest to all scientific entomologists, but the treatise in the German language in which it was propounded (*cf.* Ent. Mo. Mag., xvii, p. 259), is not in many hands in this country, and this translation of it into French by M. Lichtenstein will prove to be a real boon to students in England as well as in France, and will doubtless conduce to extended observation and experiment. The translation has been made with the sanction of Dr. Adler, who has also aided in its production by giving the original large folded coloured plates, without which, as Lichtenstein says, it would have been difficult to comprehend some points. In the "Introduction" (from which an extract will be given) M. Lichtenstein avows his adhesion to Dr. Adler's theory, and interprets the facts observed as being in accordance with his own ideas of the biology of *Aphides*, which have frequently been adverted to in this Magazine.

Part 2 of the work is to contain a description of new species found in the South of France.

Obituary.

Professor C. G. A. Giebel, the successor to Burmeister in the direction of the Museum, and professorship, at Halle, died on the 15th November last. He was born at Quedlinburg, 13th September, 1820. His writings were very versatile, but probably he was best known as a palæontologist, and many papers on fossil insects were written by him. Outside palæontology he published much on the Bird-Lice (*Mallophaga*) which he made his speciality, and in 1874 he produced an enormous folio work, with 20 coloured plates, on these creatures, under the title "*Insecta Epizoa*," which, to a great extent, should be regarded (as the title-page indicated) as a posthumous work by Nitzsch, edited by Giebel, but with very much original matter by the latter. In journalism he was known as the chief editor, for many years, of the "*Zeitschrift für die gesammten Naturwissenschaften*," which holds a respectable position amongst Natural History journals in Germany.

Jules Putzeys. We regret to announce the death, at Brussels, on the 2nd of January, of this prominent Coleopterist, in the 73rd year of his age. Putzeys held high official government appointments in Belgium, and at his death was general honorary secretary to the Minister of Justice, in addition to other honours, not the least of which was that of "Trustee" of the Belgian Museum of Natural History. He was especially a Carabologist, and his first published entomological paper related to this group, and appeared in the *Stettin Zeitung* for 1845, and that journal contains many of his somewhat voluminous writings, almost down to date, though he

also published much through the various channels for such memoirs in Belgium. His death, following so soon on that of Baron Chaudoir, leaves a great gap in the students of this special branch in Europe. We have reason to believe that his collections have been bequeathed to the Belgian National Museum, the already extensive riches of which they will greatly swell. In him Belgium has lost one of her most highly honoured and respected naturalists.

North Middlesex Natural History Association.—We hear that under the above name a new Natural History Society has been established at Holloway (temporary address, 26, Ingleby Road, Grove Road), to which we wish every success. The Annual Subscription is Half-a-Guinea. The Meetings are held every Tuesday, at 8 p.m.—EDS.

The "Rivista Scientifico-Industriale e Giornale del Naturalista."—The old-established Italian Magazine indicated in the first half of the above title, now appears in an enlarged form with a strong natural history direction, under the editorship of Prof. Guido Vimercati, Treasurer of the Italian Entomological Society, with whom (amongst others) are associated the following names known to Entomologists, viz.:—P. Bargagli, G. Cavanna, G. Malfatti, and P. Stefanelli. It appears twice monthly, and the subscription (outside Italy) is 12 francs (address, G. Vimercati, 1, Piazza Cavalleggieri, Florence). "All original notes possessing general interest will be published in three foreign languages, English, French, and German." We are rather sorry to notice that a lottery (prizes of books, apparatus, or collections) is offered as an inducement to subscribers.—EDS.

ENTOMOLOGICAL SOCIETY OF LONDON: Anniversary Meeting, *January 18th*, 1882.—H. T. STANTON, Esq., F.R.S., &c., President, in the Chair.

The following were elected Members of Council for the ensuing year, viz.:—W. Cole, E. A. Fitch, F.L.S., W. A. Forbes, B.A., F.L.S., F. Du Cane Godman, F.L.S., Rev. H. S. Gorham, F. Grut, F.L.S., W. F. Kirby, F. P. Pascoe, F.L.S., O. Salvin, M.A., F.R.S., E. Saunders, F.L.S., H. T. Stainton, F.R.S., Lord Walsingham, M.A., F.Z.S., and C. O. Waterhouse.

The following Officers were subsequently elected, viz.:—President, H. T. Stainton; Treasurer, E. Saunders; Librarian, F. Grut; Secretaries, E. A. Fitch and W. F. Kirby.

The President read an address which was ordered to be printed, and the Meeting terminated with the usual vote of thanks to the Officers for their services during the past year.

A FEW WORDS ABOUT *EPISCHNIA* (*ANERASTIA*) *FARRELLA*.

BY H. T. STANTON, F.R.S.

In my "Attempt at a systematic catalogue of the British Tineidæ and Pterophoridæ," published in 1849, the following note occurs (at p. 4) after the synonymy of *Anerastia lotella* :

"Mr. Doubleday and Mr. Curtis have each a specimen apparently distinct from this, with a pure white streak from the base to the apex near the costa, the costa itself beyond the middle being dark. They were taken at the lighthouse at Lowestoft."

The following year, 1850, John Curtis published in the Annals and Magazine of Natural History (second series, vol. v, pp. 110—121) some "Notes upon the smaller British Moths, with descriptions of some nondescript or imperfectly characterized species." Amongst these notes there appears (at p. 114) a description of *Anerastia Farrella*.

Mr. Curtis adds, "For a specimen of this pretty and distinct species I am indebted to Mr. H. F. Farr: two or three were taken at the North Lighthouse, Lowestoft, the beginning of June, 1840."

In 1851, appeared my "Supplementary Catalogue of the British Tineidæ and Pterophoridæ," in which (at p. 1) *Anerastia Farrella* is introduced, with a reference to the Curtisian description and to the note in my previous Catalogue, and there is added :

"This species has also occurred on the coast near Deal."

Fourteen years elapsed before any further notice of this species appeared, when A. Constant described it under the name of *Myelois Lafauryella*, from a single female, which he had taken in the sandy department of Landes, during an excursion he had made there in company with Mons. Lafaury; this description is in the Annales de la Société Entomologique de France, 1865, p. 189, and is accompanied by a figure of the insect, pl. 7, f. 1.

Four years later we learn that this insect, which had been found on the sandy coasts of Norfolk, Kent, and Western France, was also no rarity on the shores of the Baltic; for in the Stettin. entom. Zeit., for 1869 (p. 289), Baron von Nolcken wrote as follows:—

"Near Stettin there occurs an *Epischnia*, which the Lepidopterists there have collected in numbers, and have distributed under the name of *Lafauryella*. Lately Dr. Schleich wrote to me that Herr Miller had likewise discovered the larvæ in the flowers of *Anthyllis vulneraria*; probably in a short time we shall now learn the entire natural history of this species. The name of *Lafauryella* was, as they told me at Stettin, given to it by Constant, but I have neglected to ascertain where he described it—but it has another and probably older name, which seems to be quite

unknown on the Continent, though given to it by Curtis in 1850, as pointed out to me by Mr. Stainton when I showed him specimens of the Stettin species. Curtis described it in 1850 as *Farrella* in Ann. and Mag. Nat. Hist., 2nd Series, v, p. 114, and Stainton places it in his Supp. Cat. of Tineidæ, 1851 (p. 1). I mention these references in order that when the now imminent discovery of its entire natural history comes to be published they may be duly utilized."

In Kaltenbach's "Pflanzenfeinde aus der Klasse der Insecten" (of which the first portion appeared in 1872), we read (at p. 119), under *Anthyllis*:

"*Epischnia Lafauriyella*, Const.—Herr Miller discovered the larva of this species in the flowers of *Anthyllis vulneraria*, in 1869."

In the same year, 1872, Zeller in his "Beiträge zur Kenntniss der nordamerikanischen Nachtfalter," which appeared in the "Verhandlungen der zoologisch-botanischen Gesellschaft in Wien," has noticed of *Epischnia Farrella* (p. 558), of which he records the occurrence of a specimen in North America (at Beverly in Massachusetts) that

"This species which appears to occur on all the Northern Coasts of Central Europe, is found on the coast of Pomerania on *Anthyllis vulneraria*; the larva is most easily obtained after it has spun up a sand-ball for hibernation by passing the sand through a sieve; in the spring it spins an elongate cocoon, in which it changes to the pupa-state."

In 1880, we find a further notice in the Stettin. entom. Zeit., in a paper on "Pomeranian Micro-Lepidoptera by F. O. Büttner, with additions by Professor Hering and Dr. Schleich," here we read (at pp. 393, 394):

"*Epischnia Farrella*, Curt. (*Lafauriyella*, Const., Ann. Soc. Fr., 1865).—The perfect insect is often abundant from the middle of May to the end of June amongst the sand-hills near Misdroy, a watering place on the Baltic Coast. The larva feeds on *Anthyllis vulneraria*, is full-fed in September, when it descends below the surface of the sand and spins a spherical ball, in which it passes the winter as larva. The following spring it quits this hibernaculum and then spins an elongate cocoon, which in captivity is sometimes on the soil, sometimes in the corners of its cage; within this cocoon it assumes the pupa-state in about a fortnight, and in about three weeks the imago appears. In its habits and mode of life it wonderfully resembles the larva of *Gelechia malvella*, Hüb."

It is not quite clear to me whether the *three* weeks begin to count after the pupa-state is assumed, but I should imagine that would most probably be the case.

As to the habits of *Gelechia malvella*, which have been given in some detail by Fischer von Röslerstamm in his "Abbildungen, etc." (at p. 121), I may speak from personal experience.

The larvæ of *Gelechia malvella*, which can be collected by hundreds in holly-hock seeds, require to be kept out of doors; they soon enter the earth and there form round habitations in which they pass the winter unchanged; in the spring I saw them crawling about the cage by scores, looking none the worse for a winter's residence underground, and not needing any further nourishment; they soon spun their proper cocoons, chiefly among leaves on the surface of the ground, and the perfect insects came out very freely. Whether the larva of *Epischnia Farrella* also crawls about in the spring is not mentioned, but I should think it extremely probable. Perhaps on this point we may soon obtain further information, and I should also like to hear precisely *how* it treats the plants of *Anthyllis vulneraria* on which it feeds;—if by rolling the leaves, by spinning web, &c.

Mountsfield, Lewisham :

February 2nd, 1882.

Anerastia Farrella.—I note that Mr. Edward A. Atmore records the rediscovery of *Anerastia Farrella*. This should scarcely be called a rediscovery, because it has been taken many times since 1844 (the date mentioned as that when Mr. Farr left Norfolk) by Mr. Thomas Brown, of Cambridge. I received several specimens from him about the year 1870, which he found on the sand-hills near Yarmouth, while searching for *Crambus fascelinellus* and *Nyctegretes achatinella*. These specimens are now distributed amongst the principal collections in this country.—E. G. MEEK, 56, Brompton Road, S.W. : February 6th, 1882.

LIFE HISTORY OF *CALLIDRYAS DRYA*, BOISD.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

This fine butterfly was local in the neighbourhood of Valparaiso, but where its food plant occurred was tolerably plentiful. The males flew rapidly during the heat of the noon-day sun, and, as at that time of the day there was usually a strong breeze blowing, they were extremely difficult to catch, for if struck at and missed, they went off down wind at a headlong pace, and were soon lost to view. The country they frequented was steep and bushy, with large boulders of grey granite scattered on the surface, and in many places intersected by deep fissures, which made it anything but pleasant for an excited chase after such a swift-flying insect. The females were exceedingly scarce in comparison with the males, being in the proportion of about

one to twelve, but they were far more easy to catch, as they flew among the branches of their food-plant, searching for a suitable place to deposit their eggs. Strange to say, hardly a specimen captured was perfect, although in many instances they seemed to be fresh from the chrysalis, yet had large pieces chipped in most cases from their hind-wings. This was caused by the males, who, when seeking their mates, were so numerous, that they were often to be seen in a throng fluttering round a single female, and, in their eager struggles, urging her amongst the low and thorny brushwood, where her wings soon became damaged.

The eggs were laid on the under-side of the terminal shoots of *Cassia Candolleana*, Vog.—called by the Chilians the “Flor del Mayo,”—upon which shrub the larvæ appear exclusively to feed. When young they live between united leaves, but as soon as they become half-grown, they emerge and feed exposed on the upper surface of the leaves, continuing to do so until full-fed. They can then be seen without much difficulty, stretched at full length along the centre of the leaf, with their claspers firmly fixed to a silken pad. They are not to be dislodged with a beating-stick. The mature larva is of a dark pea-green colour, thickly irrorated with slightly raised black dots, which give it a somewhat rough shagreened appearance; a broad, granulated, lemon-yellow and orange stripe runs just above the spiracles, which are black; on each segment above this yellow stripe are four small, square-shaped black spots; head, pro-legs, claspers, and entire under surface pale pea-green. The whole larva bears a strong resemblance to that of *Gonepteryx rhamni*. I was unable to find a chrysalis among the branches of the *Cassia*, but in confinement, the larva, when full-grown, attached itself to a silken pad, encircled itself with a thread, and, in this position, changed to a bright beautiful green and much-angulated chrysalis, with pale yellow dorsal and spiracular lines, and enormously developed wing-cases. The change from larva to chrysalis was extremely rapid. A full-grown larva which was found on the afternoon of 4th January attached itself the same evening, and, upon looking at it at four o'clock the following afternoon, it had, in that short time, become a chrysalis, which produced a male butterfly on the 21st of the same month, so that the whole period from larva to butterfly was just seventeen days.

The perfect insects differ slightly from the descriptions and figures in Butler's monograph, but, probably, this difference is merely local.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 205.)

13. PIEZURA, Rond.

Gen. ch.—Head smooth and semi-circular; eyes large, bare, and sub-contiguous in the male; antennæ long, the third joint about three times the length of the second; arista plumose; alulets of moderate size, with unequal scales; abdomen depressed, with five distinct segments; wings with the veins as in the genus *Homalomyia*; legs simple.

P. PARDALINA, Rond.

This genus contains, as yet, only one recorded species, which bears a strong general resemblance in form and structure to those in the genus *Homalomyia*, but differs by having the arista plumose, and the abdomen with five segments, four only being distinct in the *Homalomyia*.

P. pardalina is of a pale yellowish colour, the face is silvery-white; the eyes in the male are bordered, and separated above, by a double white stripe, which extends to the vertex, where a small elongated triangular black spot is interposed, upon which the ocelli are placed; the antennæ are yellow, with the third joint grey, the colour becoming darker towards the end; the thorax is pale slate-grey, and has a wide central longitudinal dark stripe, with two lateral, somewhat semi-lunar, longitudinal spots, one over the base of each wing; the shoulders are yellow; the scutellum is grey at the base, but yellow at the apex; the abdomen is yellow, with a more or less distinct, narrow, interrupted, black dorsal stripe on the last three segments, and a black mark on the margins of the third and fourth segments; the sub-anal male appendages are large, globular, and of a yellow colour; the legs are entirely yellow, with the exception of the tarsi, which are black. Long. ♂, 6 mill.*

I have not seen a female, but Rondani says that it is very similar to the male.

This peculiar species appears to be rare on the continent of Europe, as well as in England. I am not aware that its occurrence has been recorded anywhere except in Italy. I have seen two British specimens; one was captured by myself near Bicester, in Oxfordshire, and the other was found by Mr. C. W. Dale near Oxford.

14. AZELIA, R. Desv.

Atomogaster, Macq.*Anthomyia*, p. Meig., Schin.*Aricia*, p. Zett.

Gen. ch.—Head round; eyes very large, bare, contiguous in the

* I gladly accept the suggestion made by Mr. McLachlan in the last number of this Magazine, and for the future will use millimètres instead of lines in the measurement of *Diptera*.

males; ocelli large and prominent; frontal bristles wanting; arista bare, or pubescent; alulets small, but with the scales usually unequal in size; abdomen cylindrico-conical, with only four distinct segments, each of which is mostly marked with three spots, one central and elongated, and two lateral and round; wings veined as in the *Homalomyia*, but with the axillary less approximated to the extremity of the anal veins: hind tibiæ of the males often bearded on one or the other side with long hairs.

Females with the eyes separated by a moderately wide space, furnished with a single row of small bristles on each side; abdomen pointed, and marked as in the males, but with smaller spots.

Sect. 1—*Halteres pale*.

- | | |
|-----------------------------------|-----------------------------|
| 1. MACQUARTI, Stæg. | 3. CILIPES, Hal. |
| <i>triquetra</i> , p. Macq. | <i>triquetra</i> , p. Macq. |
| 2. ZETTERSTEDTI, Rond. | <i>tibialis</i> , Stæg. |
| <i>triquetra</i> , Fall. et Zett. | <i>Stægeri</i> , Zett. |
| 4. TRIQUETRA, Wied. et Meig. | |
| <i>nudipes</i> , Zett. | |

Sect. 2—*Halteres black*.

- | | |
|-----------------------|--------------------|
| 5. GIBBERA, Meig. | 6. ATERRIMA, Meig. |
| <i>ærea</i> , Zett. ? | |

This group, though closely related to the *Homalomyia*, is well characterized, and has been recognised as forming a distinct genus by most modern authors, except Schiner, who, in his most valuable work (*Fauna Austriaca, Diptera*), still retains it in his great and heterogeneous genus *Anthomyia*. It was elaborately monographed by H. Loew in 1874,* and revised by Rondani in 1877.†

The British species in the first section may be thus tabulated:—

Hind tibiæ of ♂ with long hairs on both outer and inner sides	1. MACQUARTI.
" " " on inner sides only	2. ZETTERSTEDTI.
" " " on outer sides only	3. CILIPES.
" " " on neither side	4. TRIQUETRA.

All these four species have the alulets and wings more or less fuscous or nigrescent. *A. Macquarti*, which is the most common, is also usually the largest; besides having long cilæ on both sides of the hind tibiæ, the males are also furnished with a single long straight bristle in the middle of the under-side of the middle femora. The females sometimes have the fore tibiæ piceous, or even testaceous, and may be found in abundance on horse-droppings in roads in woody places. I know of no

* Entomologische Miscellen., Breslau. † Dipterologie Italica Prodrum., Vol. vi.

specific characters by which they may be distinguished from the females of the allied species. *A. Zetterstedti* has the long ciliæ of the hind tibiæ arranged in a double row on the inner and anterior sides, and has two or three strong bristles on the under-surface of the middle femora. This little species (usually the smallest) is not uncommon. I do not know the female. *A. cilipes* has the beard on the hind tibiæ of the males longer and stronger than in either of the other species, and placed on the outer (or rather hinder) sides only; it has also a single very long bristle projecting straightly outwards a little before the end of the tibia below the beard. The legs are all more or less piceous, the tibiæ being often testaceous. In size it nearly equals *A. Macquarti*, the males being about 5 millimètres in length. It is not common. The female is unknown to me. *A. triquetra* is about the size of *A. Zetterstedti*, or a little larger, the males measuring from $3\frac{1}{2}$ to 4 millimètres in length. It is easily known by its simple hind tibiæ. There is usually one long bristle on the under-side of the middle femora, as in *A. Macquarti*. It is generally distributed. I have not seen the female.

A. GIBBERA, Meig.

This little species, from $2\frac{1}{2}$ to 3 millimètres in length, has black halteres, as well as nigrescent alulets and wings; the thorax is deep black; the abdomen is dark grey, marked in the ordinary manner, but with the spots large and sometimes confluent, when they become indistinct; the scales of the alulets are very small, and almost or quite equal in size; the hind tibiæ are ciliated on the under-side with long hairs arranged in two rows. Very rare. I have only seen one male, captured by Mr. Verrall at Rannoch, which he kindly sent for my inspection.

A. ATERRIMA, Meig.

This is an aberrant species, the abdomen being without the characteristic spots; it resembles the other species in the genus, however, by the form and structure of the head, abdomen, and wings. It is entirely black, with the exception of a narrow white seam on the posterior edge of each abdominal segment; the halteres are quite black, as well as the alulets, the scales of which are small and equal in size; the wings are nigrescent; the legs are black; there is a single straight bristle on the under-side of each middle femur; the hind tibiæ are simple. Size of male about 3 mm. I have seen but one specimen of this little fly, also from the collection of Mr. Verrall.

15. CELOMYIA, Hal.

Homalomyia, Rond.

Aricia, p. Zett.

Gen. ch.—Eyes of moderate size, bare, sub-contiguous in male, not covering the lower third of the sides of the head; forehead and epistome rather prominent; proboscis membranous and somewhat elongated; arista tomentose; abdomen with five segments, very depressed, membranaceous beneath, concave, and without plica; alulets small and sub-equal; wings and legs as in the *Homalomyiæ*.

This genus* differs from all the three preceding ones by having the head more or less angular, with smaller eyes and prominent forehead and epistome. The concave membranaceous state of the ventral surface of the abdomen, which looks as if the under halves of the rings had disappeared, is not exclusively confined to this genus, for the same peculiarity may be observed in the *Homalomyia*, but the "plica" (a membranous, or vascular?, cord, with diverging processes, which connects the base with the apex of the abdomen) is always present in the latter genus, while it is very short and almost abortive in *Cæatomyia*.

C. MOLLISSIMA, Hal.

spatulata, Zett.

This, the only known species, is peculiar by having the abdomen of the males of an obovate or spatulate form;† the wings and alulets are nigrescent; the halteres yellow; the thorax black and unstriped; the abdomen grey, marked with a longitudinal line and three broad transverse marks, which assume a triangular form, being attenuated towards the sides; the legs are black, the middle femora are thickened in the centre, and furnished beneath with a strong black beard; the middle tibiæ are narrow at the base, and become gradually larger towards the end, which is ciliated on the inner side with short hairs.

The female has the forehead prominent, the eyes separated by a wide space of a whitish-grey colour, with a black central stripe (often red in front); the thorax grey, and rather indistinctly striped; the abdomen short, oval, and pointed, of an uniform greyish-black colour; the wings grey, with yellow bases; the alulets and halteres yellow; the legs simple.

This peculiar species occurs chiefly in the north of England. I have found both sexes in tolerable abundance in a swampy place in a wood near Bradford, during the month of May, upon the flowers of *Caltha palustris*.

(To be continued).

ALTERNATION OF GENERATION IN THE CYNIPIDÆ.

BY J. LICHTENSTEIN.†

So far as one genus at least is concerned, I am able to uphold the theory of M. Adler. I do this with the greater pleasure, because in it I recognise the laws that I have traced in my preceding works on the "Homoptères monoones," and I am very glad to render deserved homage to the learned compatriot of Fabricius.

* Haliday's description is given in a note in Westwood's Generic Synopsis at the end of the second volume of his Introduction to the Modern Classification of Insects, p. 143. It is as follows; "*Cæatomyia*. Abdomen, ♂, obovatum, ventre concavo toto membranaceo (absque plica aut linea coriacea longitudinali). Facies brevis impressa. Peristoma oblongum. Labium subelongatum (membranaceum tamen). Calyptra jam minima (ut in *Homalomyia* division 2, *Delia* R. D.). Antennæ pedes aequæ *Homalomyia*."

† I consider that this should be looked upon as a specific, and not as Haliday made it, a generic character.

‡ From the "Introduction" to M. Lichtenstein's Translation of Dr. Adler's treatise.—*Vide ante* p. 215.

In November, at Montpellier, we find in abundance, under the leaves of *Quercus pubescens*, the small flattened gall, in form of a small shirt-button, applied to the lower surface of the leaves. These brown, rather hard, galls fall to the ground in the winter, and from them, in the spring, comes forth the Cynipid called *Neuroterus lenticularis*, which is described by Réaumur.

All the individuals of a species of this genus are identically the same. They have been deemed to be females, because they have an ovipositor and eggs, but, for my part, I believe they are without sex, and their so-called eggs are gemmations. I consider them to be larval forms, corresponding to the "phase emigrante," which I have described in my "Considerations sur la génération des Pucerons ;" and I give the reason why I so understand it.

I found, in the month of April, a *Neuroterus* occupied in puncturing a terminal bud of a young oak. Over the little branch bearing this bud, I slipped a tube like a lamp-glass which I fixed thereon, at one end, by a cork cut in two pieces, and having a notch in the centre to admit the branch, the other end with a cover of muslin.

My *Neuroterus* was so busy with oviposition that it did not fly away, and I was enabled to ascertain that it pierced the bud with its long, spiral ovipositor, five times one after the other. The next day it was dead, and fallen down in the tube, whence I removed it and pinned it for my collection, having first assured myself by an attentive examination that it was certainly *Neuroterus lenticularis*.

I then substituted for the tube a covering of muslin round the branch, sufficiently large to allow the leaves to develop, and in order to avoid any error, I removed all the buds except the one that I had seen pierced by the Cynipid.

On the 20th April, five days afterwards, the leaves of this bud, rather largely developed, bore five little galls of the size of small peas, fleshy and transparent, like a white gooseberry, which were the well-known galls from which *Spathegaster baccarum* is disclosed.

Half of the miracle was thus beyond doubt: an insect of the genus *Neuroterus*, proceeding from the hard, button-shaped galls of the autumn, produces by its puncture the fleshy gall of the genus *Spathegaster*.

This last genus is sexuate ; it has males and females which copulate, and, if Dr. Adler has spoken the truth, which to me is beyond a doubt, because I have seen it, the female of *Spathegaster* punctures the leaves and deposits there the true egg, around which the Neuroterian gall is developed.

Presuming that the readers of this are acquainted with my theory of the phases of evolution of monoic insects, I thus classify the phases of the evolutionary cycle of *Spathogaster baccharum*, Linn. :

1. Eggs of the <i>fecundated</i> female, and the larvæ proceeding therefrom, in the hard autumnal galls	} Founders. (<i>Pseudogyna fundatrix</i> .)
2. Winged emigrants without sex, all identical, having a long spiral ovipositor with which the buds are punctured (<i>Neuroterus lenticularis</i>)	} Emigrants. (<i>P. migrans</i> .)
3. Egg-buds and larvæ proceeding therefrom, which are enclosed in a fleshy gall of the form of a gooseberry	} Gemmations. (<i>P. gemmans</i> .)
4. Sexuated insects, <i>Spathogaster baccharum</i> , Linn., males and females	} Sexuated. (<i>sexuata</i> .)

Entomological tradition makes it difficult for the mind to adopt the idea that a winged form, having an ovipositor, and furnished interiorly with a store of eggs, prodigiously like an ovary, should be only a larva which will afterwards be reproduced as an apod, vermiform larva, which will lead on to sexuated forms.

I admit that this is rather difficult to understand, and yet I have before me, in my cabinet, a nymph of *Cantharis vesicatoria*, which appears quite ready to burst and render the perfect insect; eyes, feet, and mandibles are visible, and yet, I expect, as with *Meloe* and *Sitaris*, to see this pseudonymph stop in its development, again become a larva, and only then undergo the new transformations which will end in the perfect insect.

Why, then, should I not admit among *Aphides* and *Cynipidæ* a winged form perfectly imitating the perfect insect, *except as to the genital organs*, capable of suddenly producing a new larval form, which will eventually become sexuated?

The fact is there, broadly: I do not attempt to explain it, but I declare it boldly; and every one may convince himself that a single egg of *Phylloxera* or a single egg of *Spathogaster* will produce, after a series of diverse forms, males and females; and before these sexuated insects appear, would be seen winged insects which have every sign of the perfect form, except that they are all absolutely alike (in their well-known phase), and that they are reproduced without having any sex, by gemmation, sometimes with organs and modes of reproduction so like those of true females that if it were not for the *absence of a corresponding male form*, and the nature of the product accruing—all very different from the first larva of the founders,—they might be taken, as till now they have been taken, to be true females.

It is to be quite understood that I do not compel any one to believe this, but it is very easy to verify all that I have advanced ; for almost all plants nourish *Aphides*, and, at least, twenty or thirty species of *Cynipidæ* are abundant on our oaks ; and it is only required to show if I am in error in what it consists. As to the anatomy, I beg to be excused, not knowing anything of it ; but when I see a fact so patent as, for example, that of an insect coming out of a gall, and by its puncture producing, *before my eyes*, one totally different, whence comes another insect, I can well say that the first is simply a link in the complete evolution of the creature. This system will probably reduce by half the number of species, and, perhaps, of the genera, in the two groups mentioned. This is the business of the Linné of the future, and it will not, perhaps, be a great evil.

ON THE BUTTERFLIES OF THE GENUS *TERACOLUS* OCCURRING
AT ACCRA, GOLD COAST.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

In my Revision of the Lepidopterous genus, *Teracolus* (P. Z. S., 1876, pp. 125—165), in which 129 species were enumerated, only five were noted as occurring upon the Gold Coast.

Last year, Mr. E. T. Carter sent us eight examples (four species) from Accra (representing, so far as he then knew, the whole of the species obtainable there): finding that the greater part of these differed from any specimens which we possessed, he, at my request, very kindly obtained more examples, which he has generously presented to the Museum collection.

The following is a complete list of the species collected by Mr. Carter.

1. *TERACOLUS CARTERI*, *sp. n.*

♀. Allied to *T. Isaura* and *T. Helle* of Abyssinia, and *T. Hyperides* of S. Africa ; but decidedly larger, altogether more brightly coloured, and with much broader external borders than any of these species.

Wings, above, pale sulphur-yellow, the basal area, almost to the middle, suffused with greyish-brown ; a broad, internally dentate-sinuate, blackish-brown external border ; primaries with the apical two-thirds of the costal margin blackish ; a conspicuous oblique black spot at the end of the cell, and a much larger, but diffused, spot at external third of interno-median area ; apical area, almost to the middle of the wing, vermillion-red, with a slight magenta shot, its outer edge oblique, and with a diffused orange border ; this red area is divided by longitudinal, black-brown stripes upon the veins, and interrupted in the middle by an oblique band, widest upon the costa, and extending to the third median branch ; secondaries with traces

of the usual rectangular greyish-brown stripe, producing the appearance of a sub-marginal series of seven inverted bell-shaped spots; body black, with greenish-grey hairs: wings, below, white; the basal area broadly suffused with sulphur-yellow; the external border also yellowish, crossed by tapering longitudinal black stripes on the veins; outer margin narrowly black, fringe white; primaries with the discoidal and interno-median black spots as above; a broad, oblique, reddish-orange, sub-apical belt, in the centre of which is an abbreviated, oblique, dusky line, representing the narrow band of the upper surface; secondaries with the basal half of costal border, a streak on the interno-median interspace, the indistinct angulated discal stripe, and a black-dotted conspicuous spot at the end of the cell, bright cadmium yellow; body, below, white.

Expanse of wings, 56 mm.

One fine example obtained.

2. TERACOLUS OCALE.

♀. *Anthocaris Ocale*, Boisduval, Sp. Gén. Lép., 1, p. 584, n. 37 (1836).

The ordinary female is described by M. Boisduval; but his specimen evidently had the external area of the secondaries somewhat more suffused with blackish than in the example before me, since the angulated discal stripe is said to be confounded with the outer border; this character, however, is liable to variation in other species of the genus.

The male and the albino-female fulfil Dr. Boisduval's supposition respecting the male, "nous soupçonnons que le mâle doit avoir une grande analogie avec celui de cette dernière espèce" (*Arethusa*), since they principally differ in their smaller size, smaller and better separated black marginal spots, and in the paler coloration of the under-surface: Cramer's figures of *T. eboarea*, ♂ (pl. 352, C. D.), would do very well for the male of *T. Ocale*, if the apical band were vermillion-red instead of carmine.

3. TERACOLUS ARETHUSA.

♀. *Papilio Arethusa*, Drury, Ill. Exot. Ent., II, pl. 19, figs. 5, 6 (1773); ♂ (*Anthocaris a*), Boisduval, Sp. Gén. Lép., 1, 582, n. 35 (1836).

Five females.

The male of this species appears to be rare; we now possess only two, to nine females.

4. TERACOLUS ANTIGONE.

♂. *Anthocaris Antigone*, Boisduval, Sp. Gén. Lép., 1, p. 572, n. 19 (1836).

The female is like a very dwarfed form of the female *T. Arethusa* ; but differs on the under-surface in its altogether paler colour and much less pronounced markings.

5. TERACOLUS CONIGER, *sp. n.*

♂. Nearly allied to *T. gelasinus* of Angola but differing in having a broad grey stripe along the internal border of the primaries, and the base of the secondaries grey, as in *T. interruptus* ; the black (internally zigzag) external blackish border of the primaries very narrow, scarcely wider than the black costal border ; the veins and the two black squamose spots on the orange area less prominent ; the marginal black spots on the secondaries sharply defined and conical ; the orange sub-apical patch on the under-surface of the primaries uniform in colour throughout ; and, therefore, considerably larger than in *T. gelasinus* ; the costal border, discoidal cell, and apical border, sulphur-yellow.

Expanse of wings, 40 mm.

One example only obtained.

6. TERACOLUS MINANS, *sp. n.*

♂. Wings creamy-white above, with rather broad, internally dentated, external black-brown borders, that of the primaries continuous, and throwing back longitudinal blackish stripes along the veins ; that of secondaries interrupted between the veins, so as to produce a series of sub-conical spots ; primaries with a blackish internal streak to outer third ; apical area broadly orange, with oblique inner edge ; two blackish dots on the third median and lower radial veins, as in the allied species ; secondaries slightly blackish at the base ; body black, thorax slightly bluish, with greyish hairs in front ; wings, below, white, a marginal series of black dots ; primaries with the discoidal cell, sub-costal area and external border sulphur-yellow ; a semi-circular, sub-apical, orange patch ; a squamose, grey, interno-median streak, ending in a blackish spot ; a black dot at the end of the cell ; secondaries with the basal half of costal margin orange ; an orange and black dot at the end of the cell ; body, below, white.

Expanse of wings, 35—38 mm.

♀. Differs from the male, above, in the broader and grey internal streak on the primaries, in having the orange area crossed just before the middle by a slender, oblique, elbowed black stripe, and in the decidedly broader external border of these wings ; the secondaries differ in having a blackish costal spot, and an undulated, squamose, blackish, or greyish, streak from the third marginal spot to the first median branch ; below, the primaries show a trace of the oblique stripe across the orange area ; the blackish interno-median spot is continued upwards as a small greyish spot above the internervular fold ; the secondaries are creamy-yellow, washed with sulphur-yellow on the external border, the orange costal stripe and discoidal spot are more prominent, and the costal spot and discal streak of the upper surface are indicated by congregations of olivaceous-grey scales.

Expanse of wings, 36—40 mm.

Two pairs.

This species is nearly allied to the following, but appears to me to be distinct.

7. TERACOLUS PHLEGETONIA.

♂. *Anthocaris phlegetonia*, Boisduval, Sp. Gén. Lép., 1, p. 576, n. 25 (1836).

The female chiefly differs from that sex of *T. minans* in the wider black stripe across the orange area of the primaries, and the marking of the secondaries above, exactly like that of the male *T. Eione* from South Africa; on the under-surface the greyish stripe across the orange area of the primaries is far less distinct, and the secondaries are altogether paler. Expanse of wings, 43 mm.

One female example.

This concludes, so far as is at present known, the species to be obtained at Accra.

British Museum :

January, 1882.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

VII. COLEOPTERA.

COLLECTED BY THE REV. A. E. EATON IN 1880.

BY H. W. BATES, F.R.S., AND D. SHARP, M.B.

[The *Coleoptera* collected by Mr. Eaton may probaby prove not of so much importance as the insects of other Orders, in consequence of the beetle-fauna of the country having already been much studied. We think it advisable, however, to give a list of the species captured, with localities, and more especially because Prof. M. P. d'Oliveira has just commenced in the "Revista da Sociedade de Instrucção do Porto," ii, No. 2 (February, 1882), a "Catalogue des Insectes du Portugal" (printed in French), commencing with the *Coleoptera*.—Eds.]

GEODEPHAGA.

Cicindela campestris, L.—One example, Cea, approaching in its somewhat flattened and strongly granulated elytra the local form *maroccana*; in colour it is conformable to the typical *campestris*.

Carabus galicianus, Gory.—One example, near Villa Real.

C. melancholicus, Fab.—Cea.

C. Steuarti, Deyrolle (Ann. Soc. Ent. Fr., 1852, p. 240, t. 5, f. 3).—One ♀ example, near Villa Real, beside a streamlet at an altitude of 2700 feet. This species has been long considered a variety of the *C. gadarramus* of Central Spain, but its specific rank has lately been pointed out by Dr. L. von Heyden (Deutsch. entom. Zeits., 1880, p.

282), who has found that, besides its differences of form and sculpture, the anal forceps of the ♂ is essentially different from that of *C. quadarramus*. It was originally discovered in a wood near Oporto, and seems to be confined to Portugal and the province of Asturias in Spain.

Chlœnius velutinus, Dufts.—Three specimens, Almodovar, resembling in size and colours examples from Tangier.

C. agrorum, Oliv.—One example, Alemtejo.

C. gallæcianus, Chaud., Monogr. Chlœn., No. 81.—One ♀ example, hills above Salamonde, agreeing with M. de Chaudoir's description in all respects, except that the sparsely and rather finely punctured interstices are distinctly elevated.

Oodes hispanicus, Dej.—One example, Almodovar.

Licinus peltoides, Dej.—Two examples, Lisbon.

Anchomenus marginatus, Lin.—Lisbon.

Steropus gagatinus, Germ.—One example, Alemtejo, similar to others from Tangier, with which it has been compared.

Patrobus rufipennis, Dej.—One example, Almodovar.

LAMELLICORNIA.

Scarabæus laticollis, Lin.—Monchique, Alemtejo.

Copris hispanus, Lin.—Algarve.

Onthophagus fracticornis, Preyssl.—Algarve.

Geotrupes momus, Lin.—Algarve.

Hymenoplia strigosa, Illiger.—Algarve.

Chasmatopterus hirtus, Blanch.—Almodovar.

Rhizotrogus flavicans, Blanch.—Many examples, Monchique. *R. æstivus*, Oliv.—Cea. *R. limbatipennis*, Villa.—One example, hills above Salamonde.

Oxythyrea stictica, Lin.—Monchique, Cintra, Lisbon.

LONGICORNIA.

Agapanthia suturalis, F.—Algarve.

Calamobius gracilis, Creutz.—Almodovar.

H. W. BATES.

DYTISCIDÆ.

Hydroporus lituratus, Brullé.—Almodovar.

Agabus brunneus, F.—Almodovar.

Meladema coriacea, Cast.—Almodovar.

GYRINIDÆ.

Gyrinus Dejeani, Brullé.—Lisbon.

HYDROPHILIDÆ.

Hydrobius convexus, Brullé.—Cea.

SCYDMÆNIDÆ.

Mastigus prolongatus, Gory.—Cea, Cintra.

CLAVICORNES.

Necrophorus vespillo, L.—Monchique.

Telopes sp.—?—Algarve.

ELATERIDÆ.

Athous sp.—?—Cintra.

MALACODERMES.

Luciola lusitanica, Charp.—Lisbon and Cintra.

Telephorus melanurus, L.—Monchique. *T. sp.*—?—Cintra.

Henicopus hispidus, Ramb.—Algarve.

Haplocnemis andalusiacus, Ros.—Algarve. *H. sp.*—?—Almodovar.

Dolichosoma nobile, Ill.—Monchique.

HETEROMERA.

Tentyria glabra, F.—Alemtejo. *T. sp.*—?—Algarve.

Scaurus punctatus, Hbst.—Alemtejo.

Pandarus castilianus, Pioc.—Villa Real.

Opatrum nigrum, Kust.—Lisbon.

Cossyphus Hoffmanseggi, Hbst.—Lisbon, near Bemfica, on the hills.

Misolampus gibbulus, Hbst.—Monchique.

Omophlus ruficollis, F.—Alemtejo, common in flowers of cistus ;
var. with entirely black thorax, Algarve.

Ædemera nobilis, Scop.

Meloë insignis, Charp.—Alemtejo ; abundant near Almodovar.

M. tuccius, Rossi.—Lisbon, on the hills west of the city.

CURCULIONIDÆ.

Brachyderes lusitanicus, F.—Cintra, Monchique.

Polydrusus setifrons, Duv.—Almodovar.

Sitones gressorius, F.—Monchique.

Phytonomus sp.—?—Algarve.

Lixus sp.—?—Cintra.

Cæliodes sp.—?—Almodovar.

PHYTOPHAGA.

Clythra sp.—?—Algarve. *C. sp.*—?—Almodovar.

Cryptocephalus sp.—?—Cintra.

Chrysomela sp.—?—Monchique. *C. americana*, L.—Monchique.

C. Banksi, F.—Lisbon.

Timarcha sp.—?—Lisbon.

Entomoscelis adonidis, F.—Cintra.

Malacosoma lusitanicum, L.—Almodovar.

Haltica sp.—?—Cea.

Sphæroderma cardui, Geb.—Cintra.

Cassida equestris, F.

COCCINELLIDÆ.

Coccinella 7-punctata, L.—Algarve. *C. variabilis*, Ill. *C. sp.*—?—Algarve.

D. SHARP.

Note on Drepana sicula.—A rather singular instance of variation (or even of degeneration from the type) arising, probably, from extreme isolation and consequent in-breeding, seems to be afforded by *Drepana sicula* in its one British locality—Leigh Woods, near Bristol.

In comparing specimens from this locality with typical continental specimens it may at once be seen that there is a great difference in the markings of the hind-wings. Between the two delicate indented brownish lines that cross the hind-wings, and in contact with the posterior of them, is, in continental examples, a large blotch of a delicate warm fawn-colour, within which are two or three small, pale yellow spots, and just behind the posterior line is a pair of distinct, round, black dots, the lower one being the larger. But in the Bristol specimens, as far as I have seen, the fawn-coloured blotch is extremely faint, the contained yellow spots hardly visible, and the twin black dots in most cases totally obsolete. I have traced them in one specimen, but much smaller and *closer together* than in continental specimens, and Mr. Grigg, who has seen most of the recent specimens, assures me that these two black dots are almost invariably absent.

This is the more remarkable because in the same specimens the *fore-wings* are often as strongly marked—with all markings complete—and as usually coloured as those from abroad, and they are scarcely inferior in size.

Much more serious results from—apparently—isolation and breeding-in, appear to be the extreme sluggishness of the perfect insects, which are scarcely ever seen to fly, the great difficulty of obtaining fertile eggs, and the subsequent delicacy of the larvæ, all of which seem to point to the gradual extinction of the species in this locality.—CHAS. G. BARRETT, Pembroke: 16th February, 1882.

Early appearance of Vespa germanica, Fab.—The unusually mild winter through which we are just passing, seems to forecast an early and, probably, prosperous season to entomologists generally, if we do not experience sharp frosts with biting east winds in March and April; at any rate, the following facts would almost lead one to suppose so:—While out for an entomological ramble on the afternoon of the 20th of last month across Wimbledon Common, I was surprised, on coming up to the remains of a felled oak, to see three queen-wasps flying lazily about the trunk, I at once captured and boxed them, and, on looking more particularly at the tree, I found the bark was in several places leaving it, it being in an advanced state of decay; on ripping off the bark in one place I found no less than thirty-eight more, in a state of stupor or torpidity, and all huddled up as close as it was possible for them to get; there had been, the night previous, a sharp frost, and the rime was still on them and all round them, the bark being saturated with moisture; on placing some of them in the palm of my hand, they speedily recovered, and walked about as though they appreciated the warmth; some few of them I took home, and, placing them loosely on my study table, they very soon flew about the room; the circumstance of so many being found hibernating together is certainly very unusual, and, probably, unprecedented. The late Mr. Smith, in his Catalogue of Fossorial *Hymenoptera*, speaks of a female of *V. vulgaris* being seen on the wing on February 13th, 1859, at Hampstead; but I can find no account of *Vespa germanica* being met with in January before. *Vespa* was not alone, as a resident under the same bark, there being numbers of *Rhizophagus bipustulatus*, as well as *Cis boleti*, *Dryocetes villosus*, *Homalium vile*, *Conurus pubescens*, *Atomaria peltata*, &c., and innumerable specimens of the Order *Thysanura*. I am indebted to the kindness of Mr. E. Saunders for identifying the wasp.—T. R. BILLUPS, 20, Swiss Villas, Coplestone Road, Peckham: February 10th, 1882.

Notes on the Coleoptera of the Hastings district.—During November and December last, I worked at a hot-bed in Guestling, and, among other things, turned up the following *Trichopterygia*:—*T. grandicollis*, in some numbers; *T. sericans*, very abundantly; *T. anthracina*, a few only; *T. picicornis*, of this rarity I secured only one specimen; *T. atomaria*, one only. *Pt. apicale*, literally swarmed. I was pleased to meet with *Philonthus thermarum*, which, I fancy, is not very common; *Phil. discoideus* was rather plentiful; I have not met with this latter in any other situation. *Cilea silphoides*, *Acritus minutus*, *Micropeplus staphylinoides*, *Falugria sulcata*, *Homalota longicornis*, *Hom. fusca*, *H. fungi*, var. *dubia*, *H. melanaria*, *Scydmænus hirticollis*, *Eumierus tarsatus*, *Oxyopoda opaca*, *O. alternans*, *Stenus declaratus*, *speculator*, *unicolor*, Er., and several other common things occurred. Probably, I might have got a longer list, had not the hot-bed been destroyed. I hope to work at the same again in the spring, when it (the hot-bed) is re-made.

The following may be worth recording:—*Ptenidium formicetorum*, from rotten wood; *Ilyobates nigricollis*, sand-pit at Guestling; *Aleochara cuniculorum*, several taken at Guestling, in May, I believe, from dead birds; *Atomaria atra*, Kr., I took, by sweeping, at Battle. *Rhyncolus cylindrirostris* was very plentiful in an old beech tree. *Bryaxis Waterhousei* occurred at Rye somewhat sparingly under stones by the river-side. *Bythinus Curtisi* in the Guestling sand-pit. *Carcinops minima*, accompanied by numbers of *Haploderus cælatus*, was obtained by shaking flood-refuse over paper.

I must not fail to mention that I am greatly indebted to the Rev. W. W. Fowler, who has kindly looked over nearly all of the above, and who also sent the *Trichopterygia* he was not certain about to Mr. Matthews. *A. atra*, Kr., was determined by M. Fauvel, to whom Mr. Fowler sent it, as was also *Al. cuniculorum*.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: *February*, 1882.

Reoccurrence of Polystichus vittatus at St. Leonards.—I am pleased to be able to report that *Polystichus vittatus* has turned up again in its old haunts at Bopeep, near St. Leonards. Only a single specimen, however, has yet rewarded my efforts; this I took under rejectamenta a few weeks ago.—E. A. BUTLER, Hastings: *January 23rd*, 1882.

Information for Coleopterists.—We have reason to believe that a new Catalogue of British *Coleoptera*, compiled by Mr. F. P. Pascoe, and brought down to date, is on the eve of publication.

No. 1 of the new "Revue Coléoptérologique" (*cf. ante*, p. 190) is before us. The publication appears likely to become a very useful one when the editor can get it into working. In size and general "get-up" it reminds us of the "Comptes-Rendus" of the Belgian Entomological Society. In it we learn that Putzey's collection and library have been bequeathed to the latter Society, not to the Museum, although they will be under the same roof.—EDS.

A request for European Thysanoptera.—I have selected the group of *Thysanoptera* for a special study, and I am very much in need of specimens of the described European species, to be enabled to avoid the renaming of species which very probably are found both in Europe and America. I have, therefore, written to Mr. A. G. Butler for his kind advice as to how or from whom I possibly could obtain specimens, and was kindly referred to you, saying that you might be able to give me some either help. Will you, therefore, allow me to ask respectfully for your kind assistance, to furnish me with specimens during the coming season, either determined or undetermined, or to give me the address of persons, especially of gardeners or farmers, interested somewhat in entomology, or of some botanists who are collecting plants themselves, so that I may correspond with them; perhaps many of your friends in different parts of the country would be so kind and willing to collect these insects for me if you would kindly urge my wish to them, and at the same time send them a list of plants on which the different species are to be found; to enable you to do so, if you should kindly decide to assist me in my researches, I will give here a list of species and the plants upon which they are found; there will be no need for your friends to determine any species, if all the specimens collected from one kind of plant are kept separate, with the name of the plant attached to them.

Phlæothrips ulmi, under bark of dead elms and other trees; *Phl. statice*, in flowers of *Armeria maritima*; *Phl. pini*, numerous under bark of old pine stumps; *Heliothrips adonidum*, in flowers and on leaves in hot-houses; *Sericothrips staphylinus*, in flowers of *Ulex europæa*; *Chirothrips manicata*, on spikes of grass; *Limothrips denticornis*, on heath and grass; *Lim. cerealium*, very common on grass and cerealia; *Aptinothrips rufa*, in great numbers in spikes of grass and cerealia; *Apt. nitidula*

on the heads of *Plantago maritima*; *Thrips ulicis*, in flowers of *Ulex europæus*, *Crocus susianus*, and corn; *Thr. phalerata*, on *Lathyrus pratensis*; *Thr. obscura*, common on wheat; *Thr. ulmifoliorum*, on leaves of elm; *Thr. atrata*, in flowers of *Convolvulus soldanella*, *Dianthus*, *Centaurea cyanus*, *Campanula*; *Thr. vulgatissima*, in all kinds of garden flowers, especially narcissi, umbelliferæ, and plenty in flowers of *Sinapis nigra*; *Thr. conorrhodi*, common in flowers of wild roses; *Thr. glossulariæ*, in flowers of gooseberry; *Thr. physapus*, in flowers of Cichoraceæ; *Thr. fuscipennis* on *Rumex*; *Thr. ericæ*, on heath; *Thr. urticæ*, in flowers of *Nasturtium*, *Thalictrum*, *Ranunculus*; *Thr. corymbiferarum*, in flowers of *Corymbiferæ*; *Thr. minutissima*, in *Umbelliferæ*; *Thr. discolor*, in flowers of *Cruciferæ*; *Thr. livida*, in flowers of *Ulex europæus*; *Thr. primulæ*, in flowers of primrose; *Thr. dispar*, on *Festuca fluitans* and other grasses; *Thr. brevicornis*, on *Festuca fluitans*; *Thr. subaptera* on *Plantago maritima*; *Thr. juniperina*, on *Juniperus*; *Thr. variegata*, on flax; *Thr. phalerata*, in flowers of *Vicia sativa*; *Thr. atrata*, on *Spergula nodosa*; *Thr. persicæ*, on diseased leaves of peach; *Belothrips acuminata*, prob., in flowers of *Galium verum*, *Lathyrus pratensis* or *Plantago* on sand-hills by the sea; *Melanthrips obesa*, in flowers of *Sinapis nigra*, *Reseda*, and *Ranunculus*; *Coleothrips fasciata*, in flowers of *Reseda*.

I shall be much obliged for any favour which may be kindly conferred upon me, and shall be most happy, if I should be able, to assist in return.—THOMAS PERGANDE, 321, D Street, S.W., Washington (D.C.), U.S.A. : *January*, 1882.

[Possibly this request may bring to the front some at present unknown student of British *Thysanoptera*.—EDS.]

Measurements in descriptive Entomology.—Under this title my friend, Mr. McLachlan, suggests (p. 205 *ante*) that British “descriptive Entomologists” should agree to adopt millimètres as the measure for insects; and for this course, two chief reasons are adduced. First, that some use the English inch as their unit instead of the Paris inch; and, second, that the millimètre is better than either. Now, I have nothing to say in defence of those who have employed the English inch, except only when they have written *coram populo*, for those to whom the Paris inch would be a myth, because the Paris inch with its divisions into 12 lines was the accepted standard, as Burmeister has shown. But I know two Englishmen, at any rate, and there are doubtless more, who have always used the Paris line in their descriptions, and never a word has been heard about any insufficiency. And such lines are sufficient, because the minuter dimensions of millimètres are misleading, even with respect to insects of comparatively small dimensions, for this reason, that absolute exactness in the stature of the individuals of a species does not exist, and line-measurement is amply sufficient to express the average size and range of variation of any ordinary insect. Any thing less than half a line in length is microscopic, and for such objects microscopic measurements must confessedly be adopted; these are equally beyond lines or millimètres. But to give in millimètres the dimensions of a butterfly which is several inches in expanse, or of a Goliath beetle or other enormous insect, the individuals of the species, moreover, varying extremely in size, is about as reasonable as always to quote large money-value in *centimes*. So that there is really no advantage to any one in using millimètres instead of the Paris inch or lines, well known throughout the scientific world,—and this is all I contend for, whether the insects be large or small.

But, suppose we were all agreed, on the score of the universal brotherhood of science, to be reformed, become decimal-doctrinaires, and give up for the future the use of one measure for the other, what is to be said about the old and young brethren of all countries who have already described thousands of insects with the old orthodox style of measurement, and the trouble they have given to their successors if their "lines" are to be converted into millimètres? Could they not well ask—"To what end will you do this, considering you understand perfectly well what is intended, and what will you have gained when you have done it?" Truly, this suggestion of the use of smaller measurements seems to be founded on the fallacy above mentioned, and the moderns who have introduced and would enforce the Procrustean standard of millimètres, to the exclusion of lines, are really the authors of needless trouble, and have much to answer for. But if it is now too late to revert to the inch and line exclusively, and it is desirable to meet objectors, the equivalent to the old measure, whatever it may be that shall be employed, could be added in millimètres, like the different thermometrical readings of Fahrenheit, Réaumur, or Centigrade, which, for those who may be concerned, are often put in conjunction.

It only remains to notice what pertains to the measurement of parts of insects, and to say that such is rarely given in figures, or if so given, is of much value; a comparative statement of relative proportion being far better, because such proportion is at once recognisable by the eye, without reference to any detached scale.

Mr. McLachlan's suggestion must be understood as his own personal proposal, and my dissent must also be considered my own individually, like the expression of the opinion of any other contributors; neither being in any way put forth editorially. —J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *February 1st, 1882.*

Measurements in descriptive Entomology.—Owing to severe family bereavement, my friend and colleague, Mr. Douglas, had no opportunity of seeing what I had written until it was on the eve of publication. This was unfortunate, because it prevented me from knowing that any British Entomologist was in the habit of using the "Paris inch" as his standard. I now find that at least two have been so doing. My friend's counter-suggestion is that the Paris inch should be our standard, to the exclusion of the English inch and the metrical (a better term than "decimal") system. No doubt the Paris inch *was* in common (not universal) use outside this country. Outside this country it is now commonly (but not yet universally) abandoned by all nations in favour of the metrical system, which is the generally accepted "standard," an end at which my suggestion was aimed. The now venerable Burmeister, who, in 1832 (English translation, 1836) when a young man of 25, wrote that "the Paris line has been adopted as unit," has now, at the age of 75, so far conformed to general usage, that in his works on the insects of the Argentine Republic, he places the metrical equivalents in brackets after the dimensions according to the Paris inch. This latter has never been in general use in this country, and I hardly expect it will now find favour as a standard with us, after having been pretty generally abandoned abroad. It appears to me much to be preferred that those British Entomologists who object to the millimètre should continue to use (as most of them did use) the English inch; it is familiar to all "Britishers" (though not always so to our foreign brethren), and it is not good that there should be two measurements in use with us bearing the same name but not equivalent in value. For my part, I have not the slightest uneasiness as to our ever adopting an *almost obsolete*

measure in the place of our own "inch," but I think the otherwise almost universally-accepted metrical standard will gradually be more and more recognised, and used, by us, when measurements may be required that concern other than British Entomologists (who will presume to draw the line?). That "thousands of insects have been described under the old system" (the "old system," according to most British Entomologists, would mean the English inch) is of little importance; monographic work is gradually reducing these, even in measurements, to a standard, which I take to be the aim (even if sometimes visionary) of every scientific writer. Some other points in my friend's notes (such as the definition of a microscopic object, and the importance of minute dimensions of *parts* of insects) must be passed over. The thermometrical allusion shows sufficiently the want of a "standard," as most of us have felt; but I may be permitted to say that our own scientific physicists and chemists now almost generally adopt the "Centigrade" reading as their "standard."

I made only "a suggestion," but it has occasioned with me an amount of correspondence, and verbal interchange of ideas, that were never anticipated. It was really addressed to British Entomologists, who in the course of their studies have been obliged to consider the question otherwise than as exclusively British. I will be especially grateful to those amongst us who use, or favour the use of, the *Paris inch*, if they will acknowledge such on post-cards (its use amongst us, unacknowledged and unsuspected, I take to be of serious importance); the question of the general adoption of the metrical system, or of the English inch, I leave to those whom it may intimately concern; each of our Entomologists can judge for himself, and the editors do not desire to raise a controversy on the subject.—R. McLACHLAN, 39, Limes Grove, Lewisham: 13th February, 1882.

The New Zealand Journal of Science.—A Journal under this title, a large portion of which will be devoted to Natural History, has been commenced at Dunedin, New Zealand, edited by Mr. G. M. Thomas, F.L.S. (published by Wilkie and Co.). At present it will consist of 48 pp. bi-monthly at 10 shillings per annum. Amongst the "contents" of No. 1 we notice a long paper by Capt. T. Broun, on "How to collect and preserve *Coleoptera*."—EDS.

Review.

PROCEEDINGS of the PERTHSHIRE SOCIETY OF NATURAL SCIENCE, Vol. i, Pt. i, 1880-81 (1881), pp. 1—42, small 4to. Published by the Society.

The completion of the Perthshire Natural History Museum at a cost of nearly £2000 (forming the Moncrieff Memorial Fund) has been taken advantage of by the Society for the commencement of the publication of "Proceedings," of which the first part is before us. At present, entomology is insufficiently represented, almost the only paper being one by Mr. S. H. Ellison, on the "Butterflies of the Perth District;" but under the energetic care of the Editor, Dr. Buchanan White, we doubt not that more space will be devoted to our science in future parts. Geological information is very full, as was natural under the Presidency of so distinguished a geologist as Prof. Geikie; so is the botanical part; and the records of excursions are very useful, readable and instructive. We wish the Society all success in its new undertaking. The form in which the proceedings are got up appears to us unfortunate, being too strikingly suggestive of newspaper columns.

NOTES ON THE LEPIDOPTERA OF WEST NORFOLK.

BY EDWARD A. ATMORE.

Probably the first insects worth boxing, which put in an appearance in this district are *Brephos Parthenias*, observed flying about woods in the sunshine as early as the middle of March, and *Cymatophora flavicornis* easily obtained about the same time by sugaring the birch-trees. An odd specimen of *Amphidasis prodromaria* may also be picked off tree-trunks. By visiting the shallows in average seasons, at the beginning of April, a few *Tæniocampa munda*, *T. rubricosa*, *T. gracilis*, *Xylocampa lithorhiza*, and *Trachea piniperda* are met with, and of course a host of the commoner *Tæniocampæ* and hibernated *Noctuæ* are also to be seen at this feast of the "Catkin." It is singular that I rarely meet with *Trachea piniperda* in the imago state, although I obtain nearly every year, large numbers of pupæ of that species, from the large fir-woods in the neighbourhood. It is now that *Eupithecia dodoneata* and *E. abbreviata* are taken among oaks, but neither are common, but if *Phlæodes immundana* be a desideratum, it may frequently be obtained in numbers, flying around alders, in the bright sunshine. Early in the month of May a number of species are of course on the move, their numbers increasing as the month advances. Perhaps the first to appear worth noticing are *Eupisteria heparata* and *Xyrsipetes impluviata*, both of which are common among the alders, and I found them more abundant than usual, last season. *Ephyra pendularia* and *Drepana falcataria* are of frequent occurrence amongst birch, which trees also yield a few *Eupæcilia maculosana* and *Lobesia reliquana*, the latter flying during sunshine. *Tephrosia punctulata* is common on alder and birch trees, its conspicuous outspread wings when at rest on the trunks rendering it by no means a difficult object to detect. In some woods *Asthena candidata*, *Cidaria silaceata*, and *Ephyra omicronaria*, the latter amongst maple, are fairly plentiful. Our heaths are enlivened by day with numbers of *Phragmatobia fuliginosa*, *Saturnia Pavonia-minor*, *Phytometra ænea*, and *Anarta myrtili*. The cocoons of *Phragmatobia fuliginosa*, resembling a piece of wool, may sometimes be found amongst ling (*Calluna vulgaris*). *Polyommatus Agestis* and *Thecla rubi* are also locally abundant on heaths, but the latter I find is more abundant in dry woods, where the trees are rather scattered. Of the *Eupitheciæ* the following are common: *E. nanata* on heaths, *E. assimilata* in gardens, *E. indigata* in fir woods, *E. lariciata* amongst larch, and *E. exigua* amongst hawthorn; the beating stick employed on hawthorns will not be altogether un-

productive, as by its means may be obtained plenty of *E. castigata*, and near the end of the month numbers of *Corycia taminata* with an occasional *C. punctata*, *Eupithecia coronata* and *E. satyrata*. At the end of the month, in damp woods on the imperfectly drained fen-lands, *E. pygmæata* is no rarity. This species in its habits bears a remarkable resemblance to many of the *Diurni*, flitting about as it does from flower to flower during sunshine, preferring, it seems to one, the flowers of species of *Ranunculus* and *Stellaria holostea*, upon which last named plant, the ♀ deposits its egg, at least so I am given to understand. Owing to its small size and dark colour it is not easy to see this species, and from its activity, I find it is not very easily captured. Of the *Tortrices* occurring here in May, the genus *Phoxopteryx* is not badly represented, but only *P. Lundana* maybe said to be ubiquitous, or nearly so; *P. siculana* and *P. uncana* are very local, although in their restricted localities numbers may be taken; *P. biarcuana* and *P. inornatana*, although not so plentiful, are far from being scarce; *P. diminutana*, however, must be considered scarce. A few more *Tortrices* are now and then met with, such as *Clepsis rusticana* among *Myrica gale*, *Stigmonota compositella* among clover, but to my knowledge only single specimens of *S. perlepidana*, *S. internana*, and *Retinia turionella* have been met with up to the present time.

Early in June when *Eupithecia pygmæata* is still abroad, and perhaps this is the best time to search for it, *Emmelesia affinitata* may be boxed by the score where its food-plant *Lychnis diurna* grows, more especially frequenting woods; at the end of the month the smaller *E. alchemillata* among nettles, and *E. albulata* among *Rhinanthus crista-galli* are equally common; *Botys lancealis* is more local, but where it does occur is plentiful. Other species which are taken more or less plentifully in this month are *Abraxas ulmata* among elm, *Asthena luteata* among maple, *Scotosia undulata* and *Lobophora hexapterata* (both rather local) among willows, *Melanthia albicillata*, *Miltochrista miniata*, *Anticlea rubidata*, *Melanippe unangulata* and *Rivula sericealis* generally in woods, where also *Xylophasia scolopacina* may be met with, flying at dusk. *Erastria fuscata* frequent among fir trees, and comes freely to sugar, *Ellopiæ fuscicaria* and *Lithosia aureola* also among fir, but not commonly; in woods also a sprinkling of *Gnophria rubricollis*, *Acidalia subsericeata*, *A. inornata*, *Eurymene dolobraria*, *Herminia barbalis*, and *Aventia flexula* may be obtained. In the fenny districts *A. immutata*, *Nonagria despecta*, and *Collix sparsata* are found flying at dusk. On heaths *Euthemonia russula* gets up in front of the collector, *Eupithecia minutata* is common and a few *Ebulea verbascalis*,

and *Oxyptilus teucris* may be dislodged from the *Teucrium scorodonia* (wood-sage) growing there, and perhaps it is worth noticing here that a single specimen of *Acidalia rubricata* has been taken on one of the heaths. At the end of the month *Coremia quadrifasciaria* appears in woods and is no rarity. This species seems to be generally distributed throughout the county, but I believe its head-quarters are in the Western and North-Western parts. It selects for repose the trunks of trees from which it is easily dislodged by the beating stick, and if unmolested after being thus disturbed, it quickly settles again on the same or on some neighbouring tree. On the higher grounds in this district *Strenia clathrata* is common enough to be designated a pest, yet it is worth boxing, as some nice varieties are met with. Of the *Eupitheciæ* not already mentioned, *E. venosata* is common among *Silene inflata* (Bladder Champion); *E. centaureata* abounds in some spots, especially where *Centaurea* grows in any quantity; *E. linariata* occurs more sparingly among *Linaria vulgaris* (yellow toad-flax), and *E. rectangularata* is far too abundant in orchards: I have seen scores sitting on the lee-side of railings, having been blown *nolens volens* out of an orchard close by. In the salt-marshes a few *Acidalia emutaria* are to be found flying at sunset. Sugar is not remarkable for the number of good things it entices (at least, such is my experience); however, by its means a few *Mamestra anceps*, *Apamea gemina*, *A. unanimis*, *Dipterygia pinastri*, *Rusina tenebrosa*, *Acronycta aceris*, *Hadena atriplicis*, *Leucania comma*, *Cymatophora duplaris*, and *Axylia putris* may be picked out of the host of commoner species congregated on sugared trees. I have also just seen a fine specimen of *Cymatophora ocularis* which was taken at sugar last season by a beginner. *Acronycta leporina* I have not noticed at sugar, although I have taken it flying around birch at dusk. *Plodia interpunctella* is very abundant in the grain warehouses of the King's Lynn Dock Company, where its larvæ probably feed on the grain or locust-beans. A few *Crambus cerussellus*, *Eupæcilia nana*, and *E. atricapitana* are taken on heaths, the latter among *Senecio jacobæa* (Ragwort); *E. udana*, *Adela rufimitrella*, and *Incurvaria Ehlmanniella* are met with sparingly in the fen districts, where also a single specimen of *Phlæodes Demarniana* has been taken by my brother; acting on the principle that "where there is one there are others," I have searched every season for this species, but my efforts have been unsuccessful up to the present time. Of the other *Tortrices* occurring in June, I note *Semasia nanana* among spruce-fir, *Dichrorampha simpliciana* and *Ephippiphora fæneana* among *Artemisia vulgaris* (Mug-wort); *E. trigeminana* rather common among

Senecio jacobæa, and *Antithesia corticana* among birch. In July many of those which come out at the end of June are still on the wing, although of course some of them are getting decidedly the worse for wear. It is now that *Polyommatus Egon* is swarming on some of the heaths by day, and long before sunset on the boggy portions of similar places, the sluggish *Schrankia turfosalis* is on the move, and in its restricted haunts is very abundant, but it is, nevertheless, rather difficult to procure in good condition; this species at the approach of danger quickly betakes itself to the under-growth, from which it cannot often be put out. When in captivity it is restless and should, therefore, be stifled as soon as possible, and afterwards pinned in the relaxing box; if boxed alive the specimens are generally worthless in the morning. A little later in the evening *Hyphenodes costæstrigalis* is roving about and is certainly as fond of sweets as any *Noctua*, but I find its near relative *S. turfosalis* is not to be allured by the employment of any such medium as sugar. In woods during the month *Macaria liturata* and *Thera firmata* may be dislodged from scotch-fir, the handsome *Geometra papilionaria* from alders, *Angerona prunaria* from sloe, and *Phorodesma bajularia* from oak. Of the *Eupitheciæ*, *E. succenturiata*, *E. subnotata*, and *E. subfulvata* occur, but only the last is common. *Pionea stramentalis* is abundant, but local, in some grassy places in woods. A few *Triphaena interjecta*, *Orthosia suspecta*, and *Tethea subtusa* are perhaps the best of those which visit sugar, and on the coast a few *Agrotis valligera* and *Hydræcia nictitans* are found flying at dusk. *Crambus warringtonellus* also occurs on the coast along with *C. inquinatellus*, and *C. pinetellus* is occasionally met with on heaths, where also *Agrotis porphyrea* is flying about in profusion. *Crambus latistrius* and *C. hamellus* also are met with here, but are local. In the salt-marshes a few *Chilo forficellus* and numbers of *Leucania phragmitidis* are flying about the drains. The latter is also common among *Phragmites communis* (common reed) in the fen districts. Of the Micro-Lepidoptera *Dichelia Grotiana*, *Carpocapsa splendana*, and *Lithographia nisella* are not uncommon. *Choreutes scintillulana* occurs among *Scutellaria galericulata*. *Eupæcilia pallidana*, *E. Manniana* and *Carpocapsa juliana* have also occurred, but never commonly. The same remark will apply to *Euchromia ericetana* and *Calosetia nigromaculana*. *Tortrix Lafauriana* is now on the wing, in this district. I took a nice series of this species last season; to all appearance it does not seem to have been taken elsewhere in the United Kingdom. Another good species taken here and which is now to be looked for, is the curious *Stathmopoda pedella*. Unfortunately the

alders from which I first obtained *S. pedella* three or four years ago, have been cut down, and although I have visited annually the alders still standing in the same neighbourhood, my efforts have only been rewarded by the capture of a solitary specimen. At the end of July or more generally during August, a few *Noctua umbrosa*, *Hydræcia micacea*, *Agrotis tritici*, *Cosmia affinis*, *C. diffinis*, and less commonly *Noctua Dahlii* and *Agrotis saucia* are taken at sugar; but *N. umbrosa* and *H. micacea* are very partial to the flowers of *Arctium lappa* (burdock). *Epione apiciaria* is common, and the same may be said of *Lithosia griseola*. The straw-coloured variety of *L. griseola* (*L. stramineola*) also occurs in the proportion of about one to eight of the normal form. Of the *Tortrices* which occur in August, *Brachytænia semifasciana* and *Semasia populana* both among willows, are perhaps the only species worth mentioning. In some seasons, at the end of August or during September, *Sphinx convolvuli* is taken. To my knowledge but one specimen was captured last season, and that was found flying at honey-suckle. A few years ago, five were taken during one September, at honey-suckle, in a garden near Lynn. *Noctua glareosa*, *Agrotis saucia*, *Xanthia gilvago*, and some of the commoner *Xanthiæ* visit sugar during the same month, and *Halonota bimaculana* is common in some places among birch.

A glance at the foregoing list and remarks will be sufficient to show that West Norfolk varies considerably in the nature of its soil, and consequently in flora, or in other words, in its physical features. I have alluded more than once to *Lepidoptera* taken on a tract of land known as the fen-land, or fen-district, and this term is probably the best I can give to describe a strip of land lying on either side of the river Nar. The nearest part of this land, which has been but imperfectly drained and consequently in some parts is still very wet, would be distant about five or six miles from this town. From an entomological point of view I regret that its re-drainage has been under consideration for some time, and what is worse still, it is likely very soon to be an accomplished fact. The soil is black and peaty, very similar to that which one finds at Wicken and neighbourhood and its flora is also not very dissimilar. Although some plants, such as *Cladium mariscus* and *Peucedanum palustre*, so conspicuous at Wicken, appear to be absent from this fen-district, nevertheless, many plants so common at Wicken, such as *Iris pseudacorus*, *Ranunculus lingua* and *flammula*, *Thalictrum flavum*, *Spiræa ulmaria*, *Lysimachia vulgaris*, *Lythrum salicaria*, *Valeriana officinalis*, grow nearly as profusely in this district. From these facts, it is not improbable that many more

species than those I have mentioned, which are plentiful in fen-districts elsewhere, might, if properly worked for, be found to occur here also.

If, however, the present drainage scheme under consideration should be carried out, many of the plants, as well as most of the species at present found, must necessarily disappear. In conclusion : should many of the localities which have hitherto, I believe, been scarcely visited by an entomologist, be worked systematically, I anticipate that some interesting *Lepidoptera* will be added to our West Norfolk fauna.

8, Union Street, King's Lynn, Norfolk :

February 1st, 1882.

SOME POINTS IN THE NATURAL HISTORY OF *PAPILIO MACHAON*.

BY WILLIAM BUCKLER.

In offering my notes on the history of this species, I know I am going upon ground to some extent already well trodden, and it is, therefore, not on the plea of telling anything quite new that I put them forward ; but, knowing that there is now, more than ever, an interest felt in obtaining exact information as to the process of growth or development in the earlier stages of various forms, and being conscious that I have done my best in this case, I still hope that my work may be of use ; I only wish I could impart to others anything approaching the pleasure I myself felt in watching and recording what follows.

In 1868, I had reared the larvæ from two eggs found in Burwell Fen by Mr. W. R. Jeffrey, and two more in 1871, from eggs found by Mr. C. G. Barrett, in Horning Fen, and had taken several figures in either case, but, when in 1879, Mr. W. H. Edwards of Coalburgh, West Virginia, put some questions to me on the number of moults and other points connected with them, I found I could not give such positive answers as I could have wished.

I determined, therefore, to rear the larva, if possible, again, and Mr. W. H. B. Fletcher most kindly helped to bring my project within range of possibility by sending me three eggs, on June 4th, 1880, which he had found the day before in Wicken Fen, and on the 12th a few more, laid on *Peucedanum palustre*, and eventually three of these proved infertile.

Of course what follows is really the personal history of the individuals which I watched, and though for convenience sake I shall generalize, and sometimes use the present tense and not the past, I wish it to be understood that I speak only of what I was aware I saw; I know I made one omission, which will be noticed in its proper place.

The eggs hatched June 13th—15th, the larvæ in every case making their first meal on the empty shell, and for a day or two I supplied them with garden carrot, but after that they were fed entirely on *Angelica sylvestris*; from first to last each larva was kept separate, and its changes noted in a separated record.

The larva, on first turning its attention to its food plant, scoops out a round cell on the surface of a leaf, but after a few hours takes the bolder course of eating quite through from the edge of the leaf; it does not roam, but continues at the same part till the third or fourth day, when it moves off to some distance and on a stalk or leaf spins a few silk threads for a foothold; there it waits from two to three days for the first moult, and when this is accomplished eats the cast skin all to the head-piece, and soon after goes—apparently by design—back to the spot where it was previously feeding, and attacks the leaf again: at this stage I noticed if a larva found a speck of frass on its food, it would pick it up in its jaws, stretch out its body, and somehow project the frass away from the plant: again, after feeding three or four days it retires as before, and prepares for and accomplishes its second moult, which happens on about the twelfth day of its life; similarly the third moult comes on the sixteenth or seventeenth day, and the fourth (the last) from the twentieth to the twenty-third day, the cast skin being always eaten: after the last moult the larva feeds on for ten or twelve days, consuming a great quantity of food and making very rapid growth; I may here note that its usual attitude in repose is from the very first much like that of a *Sphinx*, with the neck arched, and the head bent down. The earliest age at which I noticed the curious horns of the second segment was when I touched the larva *just after* its *third moult*; they were then much longer and thinner than they became after the fourth moult, but there accompanied their protrusion a drop or two of clear greenish liquid, and a most penetrating odour, which reminded me of an overkept decaying pine-apple: after the fourth moult the horns were of a shorter and stouter character, but I noticed that when I was holding a larva between my finger and thumb it had the power to lengthen one horn at the expense of the other (which became shorter), so as to manage to touch my finger with it; the horns are extremely soft and flexible. When full grown the larva

ceases feeding, and rests for a while, and then commences its preparations for pupation by selecting a stem, and spinning on it from side to side a number of threads to ensure a good foothold; next, lying along these threads head downwards it spins at the bottom of them a broad cone of whitish silk, having a sharpish apex; then turning round it creeps up the stem a little and with the anal legs feels about till they find this cone, when they are placed close together on the stem but touching the base of the cone, and a slight pushing motion is visible by which their circle of hooks is fixed in the silk spun on the stem: its tail end being thus fixed, the larva stretches out its head and front segments, lifting up at the same time the first and second pairs of ventral feet, and bends itself backwards in a wide sweep from one side of the stem to the other, as though to be assured there is free room for its movements; it next,—whilst in this semi-detached attitude—and with its thoracic legs rigidly extended, throws back its head, and in this way swells out its breast, like that of a pouter pigeon, leaving a deep hollow between the mouth and the first pair of thoracic legs; then it bends to one side of the stem and spins a broadish attachment for the first thread of the cincture, and presently with a slow and deliberate motion sweeps round as before to the other side, the head all the while wagging as the silk issues from the spinneret and is guided along the hollow above mentioned; as the head approaches the other side the body swells out still more as though to stretch the thread, and give it the necessary curvature; as on commencing the thread, so now on fastening it to the other side, there is a delay for a little, and the fastening seems to be made with a more liquid and glutinous quality of silk than the rest of the thread: the first thread thus completed, the larva proceeds in the same slow and methodical manner—spinning some thirty threads from right to left, and as many from left to right—or sixty altogether for the cincture, the time thus occupied being about one hour and forty-five minutes; occasionally the first pair of thoracic legs seemed to be called in use to assist at the fastening of the ends of the threads: when enough threads have been spun the larva seems to test their strength by pulling them quite taut with its projecting breast, two or three times, and then apparently satisfied, it bends down its head to put it under the cincture, and creeps up inside it till it hangs loosely round its back between the sixth and seventh segments: next it seems to relieve itself by stretching upward all the front segments that had been so engaged during the spinning, and in a few minutes settles into a quiet posture with head bent down and legs brought close to the stem: thus it rests, and

meanwhile the segments of the body shorten, and their divisions deepen; the head becomes bent down close to the stem, while the body is held away from it as far as the cincture allows—drawn tight as it is into the deep division between the sixth and seventh segments, so that only the head and tail are in contact with the stem; at the end of about a day and a half suddenly the head and front segments are jerked backward four or five times in succession, next the belly is brought close to the stem and the head held up, and then in about five minutes the skin splits open behind the head on the top of the back, and the pupal thorax appears bulging out; presently is disclosed the top of the head, then the upper part of the face, and with a few nodding motions the head is freed, and the skin slowly but easily slides downwards from each side (the cincture causing not the least impediment), and as it goes drags away like little threads the linings of the spiracles; presently from out of the collapsing skin is disclosed the tip of the tail, and there is just time allowed for the observer to see that it is quite *hollow*, when in another moment it is fitted upon the *cone* of silk, and strongly pressed down, and with a repeated half screwing motion the attachment is made complete; meanwhile the moisture which exudes from the pupal surface has surrounded and fairly embedded the cincture at its line of contact with the back; the old shrivelled skin now rests in a heap between the lower part of the abdomen and the stem, but is presently, by a slight twisting movement on the part of the pupa, caused to drop off: the head and thorax gradually develop themselves, the former into two largish blunt diverging processes, the latter into a central bluntly projecting eminence, with another on either side; the larval tubercles remain as small blunt conical protuberances, the wing-covers form an angular outline, and the back becomes dull and rough; just four minutes elapse from the bursting of the larval skin to the full disclosure. (Here I must express my regret that I forgot to look for the connecting membrane which was discovered in *Pieris* and *Vanessa* by Dr. Osborne, and described in vol. xv, p. 59, of this Magazine.)

The egg of *Machaon* is globular, having a depression at the base in contact with the leaflet on which it adheres; it is of a good size and with apparently smooth surface, and when first laid is of a greenish-yellow colour quickly turning green, and soon after tinged with violet-brownish, gradually deepening to purplish, and faintly showing the embryo through the shell, which in a day or two turns entirely purplish-black, a process of change similar to that shown by a ripening black currant; the shell next assumes a light pearly transparency,

and the dark embryonic larva coiled round within is plainly visible, and in a few hours hatches.

The newly hatched larva is 3 mm. long, stoutish, with shining black head and black velvety body with dark green segmental divisions, and conspicuously marked with a patch of creamy-white on the seventh and eighth segments; the pale pinkish tubercles, in some instances yellowish, rather bristly, are in two rows down either side, and in about eight hours turn dark drab, and in a day or so blackish like the third row beneath, except those on the white patch which remain white.

After the first moult, in three days the length is 8 or 9 mm., the stoutness in proportion; the head black, and the body velvety-black bearing two orange dots on the front margin of the second segment, the shining, rather pointed, black tubercles having their bases reddish-ochreous, after being for a day or so green; the white patch as before, but now bearing black tips on the tubercles.

After the second moult the length by the third day has increased to 14 mm. with increase of stoutness; the black shining head is marked on the face with a yellow chevron, and with pale yellow upper lip and bases of papillæ; the black velvety body has the white patch yet more conspicuous and encroaching a trifle on the ninth segment; the front dorsal margin of the second segment is marked with orange-yellow, and minute twin dorsal bright yellow dots are on the third and fourth, and a faint narrow transverse divisional streak of yellowish or greyish between them, other similar short streaks occur on the ninth and tenth; of the three rows of conical black tubercles on each side of the body, the two top rows have their upper bases half ringed with bright orange colour (excepting those on the white patch which have pale yellow), the lower third row have orange bases like slanting slashes; the anterior legs are whitish, tipped and spotted above with black, each ventral leg with a white crescentic mark above the foot; and there is some white on the anal flap.

After the third moult, in two or three days the length is 22 mm. and the thickness in proportion; the design now more developed shows the head yellow marked with black, and when protruded the horns coloured orange-red, the ground colour is of the palest greenish-yellow, though it is still white on the seventh and eighth segments, but showing only in transverse rings a little wider than the very narrow greenish-yellow ones round the others, for the middle of each segment is transversely banded with velvety black, but narrower on those two with white ground; the segmental divisions are greyish-black; the black velvety bands are intersected with three lines of the ground-

colour bearing the orange tubercles with black bristly apices except on the thoracic segments, where the black bands are broadest and only broken below, as on them the upper tubercles are completely surrounded with black; all the legs are white marked with black.

After the fourth moult the length in two days is 31 mm., and in five more days is 46 mm. and very stout, its size and beauty of colouring being now at their greatest; the thoracic segments swell upward in a rounded arch from the fourth which is the largest, and viewed from above sharply taper thence to the head, which is the smallest, and bends downwards; the colour of the head is bright yellow with a black oval spot on the face and two black streaks down either side, the ocelli in a black patch below, the mouth marked with black in the centre and on each side, papillæ whitish; on the front marginal ridge of the second segment occur two orange spots and two black spots in front of them close to the head, and between these pairs of spots is the concealed orifice from whence the retractile soft fleshy horns of pinkish-red colour dart forth when irritated, and when seen at this period are uniformly stout with blunt diverging extremities; the ground-colour of the smooth skin of the body is a very brilliant pale yellow-green, becoming white on the belly and ventral feet, the segmental divisions widely banded with deep purplish edged with velvety-black, and across the middle of each segment is a broad velvety-black band covered with excessively fine bristly pubescence, and bearing the orange tubercle of the upper row near the front margin, and sometimes also that of the middle row; but generally this transverse black band is interrupted by an isthmus (so to speak) of the ground-colour which bears this tubercle; and below there is always a slanting isthmus of ground-colour bearing the lower tubercle; on the third and fourth segments the broad bands have only this lower interruption, and bear the orange warts of the two upper rows (here diminished in size) in their middle; the anterior legs are white with black tips and joints; the ventral legs have each a narrow streak in front, a spot behind, and a large crescentic mark of black above the white feet which have dark hooks; on the anal legs this black mark is purplish in the middle; the spiracles are blackish-slate colour situate within the lower parts of the black bands; the whitish belly has a central series of blackish blotches, and narrow transverse bands in the deeply sunk divisions.

The pupa, when come to its full colour, is pale yellow on the back and abdomen, and delicate light green on the head and wing-covers.

ANOTHER APTEROUS MALE IN THE *COCCIDÆ* (*ACANTHOCOCCUS ACERIS*, SIGNORET).

BY JULES LICHTENSTEIN.

In 1877, I described in this Magazine (Vol. xiv, p. 34), the first apterous male I was aware of in the *Coccidæ*: it was an underground one. Since that time I discovered also that in *Gossyparia ulmi* and *Ritsemia pupifera* the males are wingless.

To-day, I have to mention another which is completely apterous; it belongs to a well-known insect, feeding on the maple-tree (*Acer platanoides* and *pseudoplatanus*) and named by Signoret, "*Acanthococcus aceris*." The maple-tree is much inhabited by bark-lice, as I have in my collection, besides the above-named "*Acanthococcus*:" *Lecanium aceris*, Curtis, 1838; Westwood, 1840; Bouché, 1844; *Pseudococcus aceris*, Signoret and others: *Pulvinaria aceris*, Licht. (ined.): *Chionaspis aceris*, Sign. All these have winged males. Curtis and Westwood have described the *Lecanium*, and Miss Smith, of Peoria (Illinois), has lately made known the *Pseudococcus*. Leaving for another occasion the monography of the maple-lice, which will some day follow the elm-lice and terebinth-lice, described already in the "Feuille des jeunes Naturalistes," I intend to speak to-day only of the "*Acanthococcus*." The female and larvæ of that insect are well described in Signoret's "Coccides," Ann. Soc. Ent. France, 1874, p. 34; but nothing is said of the male, nor of the biology.

The male is brown-reddish, of the usual form of the *Coccidæ*, but absolutely without wings. Its length is 0.70 mm., the antennæ are ten-jointed, rather hairy, and 0.38 mm.; third joint the largest; the abdomen is terminated by a small protuberance, bearing the short penis, on each side of which are two small triangular pieces supporting two long white tails of a cottony matter, as usual in the male Coccidians.

The biology is as follows:—By the beginning of May the female lays in the interior of the bag, in which she is entirely enclosed, rather large eggs, from which are produced small oval larvæ, which gather under the leaves and remain there sucking and increasing very little until the fall, when they hide in the bark-crevices. In winter the larvæ which are to become males exude a cotton-like cocoon, entirely closed in front, but open behind.

When the cocoon is ready, and in the first half of January (here at Montpellier), the larva throws off the rather strong-spined larval skin, and appears as a soft white maggot, quite smooth, showing only

rudimentary antennæ and legs, very short (0.09 mm.), and without articulations. It is a very curious state, reminding one of the pseudo-nymph of the *Meloïdæ*.

After six or eight days there is another change of skin, the exuviae of the pseudo-nymph are thrown out of the cocoon, and the larva takes the usual nymph appearance; the legs are 0.49 mm. long, and show their articulations. The antennæ have ten joints.

After another fortnight the exuviae of the nymph follow those of the larva and pseudo-nymph, and the perfect imago remains in the cocoon, while the two white tails project out of it, increasing slowly in size. A few days after, the little animal comes out backwards, and runs about on the trunk of the maple, looking for its female. They copulate and the male dies, then comes the turn of the female to form her cocoon, to lay her eggs,—and the cycle begins again.

Montpellier: 20th February, 1882.

P.S.—In the Wiener entomologische Zeitung, i, p. 60 (March, 1882), my learned friend, Dr. Franz Löw, announces that he had observed the economy of *Acanthococcus aceris* in 1877 and 1878, and had discovered that the male was apterous. It does not appear to have occurred to him to publish his important discovery until after I had written to him requesting he would communicate to the zoologisch-botanischen Gesellschaft of Vienna, my own observations on the insect, of which he makes no mention.—J. L.: 9th March, 1882.

TWO NEW SPECIES OF *ICHNEUMONIDÆ*.

BY E. PARFITT.

POLYBLASTUS BRIDGMANI, *n. sp.*

Entire length, $6\frac{1}{2}$ mm. Expanse of wings, 13 mm. Abdomen, $3\frac{1}{4}$ mm.

Niger, facie et linea ante alas et scutellum flavis. Abdominis medio fulvo, segmenti primi basi nigra: pedibus fulvis, coxis et trochanteribus anticis et mediis flavis, posticis fulvis, tarsis posticis tibiærumque posticarum apice nigris.

Head black, transverse, face below the antennæ straw-yellow, jaws yellow, their apices ferruginous, palpi yellow. Antennæ longer than the body, black, the basal joint beneath yellow. Thorax gibbous, black, finely punctured, with two raised

lines reaching from the base of the anterior wings, converging to the scutellum, a line before on each side, and a dot before, and beneath the wings, yellow. Scutellum and post-scutellum yellow, metathorax coarsely punctured (as seen under an inch objective), with two raised lines enclosing a space in the form of a Jew's-harp, with the narrow part directed towards the post-scutellum, a raised line also borders the metathorax, the whole of which is rather thickly pubescent with pale hairs. Wings broad, iridescent, and rather thickly set with short black hairs, which are bulbous at the base. Stigma and radius black, the front yellow, squamula and base of nerves yellow, intermediate and internal nerves yellowish. Posterior wings: nerves testaceous yellow, the recurrent nervure issuing from below the middle of the angulated transverse nervure. Legs fulvous, the anterior and medial coxæ and trochanters pale yellow, the posterior fulvous; base of the femora with a narrow black ring, the apical half and the tarsi of the posterior pair black, the ungues of the others testaceous. Abdomen one-fourth longer than the head and thorax, depressed, the sides nearly parallel, a little wider in the middle, the apex obtuse, the first segment and base of second and three apical segments black, the apical half, the second, third, and fourth, entirely fulvous-yellow, the basal segment with a rather widish groove along the centre, the edges of which are raised and rounded off; there are also two raised obtuse prominences, one on each side of the groove, about one-third from the base, and two yellow elliptical depressions, one on each side of the base of the second segment. The whole thickly punctured, and clothed with short depressed hairs.

I captured this species in a field of wheat near Exeter, in July, 1881, and have named it, as a slight mark of esteem and appreciation of the work done in this neglected group of British insects, the *Ichneumonidæ*, by Mr. J. B. Bridgman, of Norwich.

LIMNERIA AFFINIS, *n. sp.*

Length, 5 mm. Exp. 7 mm. Ovip. 1 mm. Antennæ, 4 mm.

Niger, abdomen elongato-clavatus sub-compressus, palpis et mandibulis stramineis, pedibus rufo-testaceis, coxis et trochanteribus anticis et mediis stramineis, posticis nigris, femoribus posticis fuscomaculatis, tibiis albis, ad apicem et basin fuscis, tarsis fuscis.

Black, head transverse, buccated behind the eyes, thickly punctured, mandibles and palpi straw-coloured, the apices of the former ferruginous. Antennæ black, the basal joint yellow or testaceous, beneath. Thorax shagreened, black; scutellum black; metathorax coarsely punctured, divided into six areas, bordered by smooth raised lines. Wings iridescent, and rather thickly set with short black hairs, radius black in front, testaceous, base yellow, intermediate and internal nerves testaceous-yellow, scale straw-colour; stigma dull white, or, in some, pale testaceous; areola with a short petiole, or, in some, sessile. Legs fulvous, claws of the anterior and intermediate tarsi ferruginous; coxæ and trochanters of the anterior and intermediate pairs straw-yellow; posterior black, or with a black patch above; posterior femora (in some) with a black spot above; tibiæ pale yellowish-white, with the base

and apex black ; the apical half of the tarsi black. Abdomen elongato-clavate, sub-compressed, black above, beneath yellow, with the edges of the segments broadly edged with dark testaceous, merging into black towards the apex ; basal segment above smooth and shining for about two-thirds its length, the apical portion thickly but slightly punctured, the sides parallel for about two-thirds, when it grows suddenly wider ; second segment twice as long as wide, and about two-thirds longer than the third segment. All clothed with a short whitish pile. Ovipositor testaceous, curved, about one millimètre in length.

I have four specimens of this species : I captured two by sweeping vetches in a field near Exeter, in June, 1881, the others I bred from a hedge at Lydford, on the border of Dartmoor. The description applies to both sexes, as do also the measurements.

This insect in general appearance and colouring might, at first sight, be taken for a small specimen of Gravenhorst's *Campoplex viennensis* ; according to this author's arrangement, it would come in his second section, but naturally it would seem to be nearly allied to *C. viennensis*, on which account I have named it *affinis*.

Exeter: 8th March, 1882.

THE BRITISH *PSYLLINA*, WITH CORRECTIONS IN THE SYNONYMY.

BY JOHN SCOTT.

Some attention being now given to this interesting group by several students, perhaps it will not be out of place for me to lay before them a complete list of the genera and species found in the British Islands down to the present time, together with such corrections in the synonymy as have been made since the publication of my Monograph in the Trans. Ent. Soc. for 1876. From the time of the appearance of Dr. Förster's Monograph, in 1848, until lately, no attempt was made to alter or interfere with his arrangement generically or otherwise : probably, this may have arisen from a paucity of observers. In 1877, however, Prof. C. G. Thomson, in his "*Opuscula Entomologica*," fasciculus, 8, gave a Synopsis of the Scandinavian species, under the title of "*Öfversigt af Skandinaviens Chermes-arter*," wherein he desires to restore the name *Chermes*, originally given to some of them by Linné ; no one, however, of late days has adopted it except Thomson, and whether he will have many followers remains to be seen. His further innovations as regards sections of the genera employed by Förster point in the right direction, and with respect to *Trioza Walkeri*, which he makes the type of a sub-genus, *Trichopsylla*, I would go further and give it generic rank ; the structural dif-

ferences of the elytra alone being a sufficient reason for doing this. Next, Dr. Franz Löw, in his "Systematik der Psylloden," published in the "Verh. z.-b. Ges.," xxviii, pp. 605—609, divided the group into sub-families, and assigned to each division various genera, which are justifiable by the structural characters he points out; thus reducing the whole family into small groups easy of recognition.

The following list, prepared mostly in accordance with Dr. Löw's views, contains all the additions made to the British species since the publication of my Monograph. His sub-families are four in number, viz.:—*Liviinæ*, *Aphalarinæ*, *Psyllinæ*, and *Triozinæ*.

PSYLLINA.

- | | |
|---|--|
| Sub-family. 1. LIVIINÆ. | PSYLLA, F. Löw (Geoff., Latr., &c., <i>partim</i>). |
| LIVIA, Latr. | 1. <i>pruni</i> , Scop. |
| <i>juncorum</i> , Latr. | <i>fumipennis</i> , Först. |
| Sub-family. 2. APHALARINÆ. | 2. <i>costatopunctata</i> , Först. |
| [EUPHYLLURA, Först. | <i>ferruginea</i> , Först. |
| no British representative.] | <i>cratægi</i> , Schrk. (<i>nec</i> Scop., Först.). |
| RHINOCOLA, Först. | <i>annulicornis</i> , Boh. |
| 1. <i>ericæ</i> , Curt. | <i>triozoides</i> , Leth. |
| <i>callunæ</i> , Boh. | <i>quercus</i> , Thomson (<i>nec</i> Linn.). |
| 2. <i>aceris</i> , Linn. | <i>puncticosta</i> , Thomson. |
| APHALARA, Först. | 3. <i>costalis</i> , Flor. |
| 1. <i>picta</i> , Zett. | <i>nobilis</i> , M.-D. |
| <i>flavipennis</i> , Först. | <i>picta</i> , Först. ? |
| <i>sonchi</i> , Först. | 4. <i>simulans</i> , Först. |
| <i>innoxia</i> , Först. | <i>pyri</i> , Scott (<i>nec</i> Linn., Curtis).?* |
| <i>alpigena</i> , M.-D. | 5. <i>pyricola</i> , Först. |
| 2. <i>nebulosa</i> , Zett. | 6. <i>pyrisuga</i> , Först. ? |
| <i>radiata</i> , Scott. | <i>pyri</i> , Schdbg. (<i>nec</i> Linn.). |
| <i>graminis</i> , Thomson (<i>nec</i> Linn.). | <i>aurantiaca</i> , Gour. |
| 3. <i>exilis</i> , Weber et Mohr. | <i>austriaca</i> , Flor. |
| 4. <i>calthæ</i> , Linn. | <i>rutila</i> , M.-D. |
| <i>polygoni</i> , Först. | <i>rufitarsis</i> , M.-D. |
| 5. <i>artemisiæ</i> , Först. | 7. <i>peregrina</i> , Först. |
| 6. <i>nervosa</i> , Först. | <i>carpini</i> , Först. ? |
| Sub-family. 3. PSYLLINÆ. | <i>cratægicola</i> , Flor (<i>nec</i> Först.). |
| PSYLLOPSIS, F. Löw (<i>Psylla</i> , auct. <i>partim</i>). | 8. <i>mali</i> , Schdbg. |
| 1. <i>fraxinicola</i> , Först. | <i>ulmi</i> , Först. (<i>nec</i> Linn.). |
| 2. <i>fraxini</i> , Linn. | <i>æruginea</i> , Först. |
| [CALLOPHYA, F. Löw (<i>Psylla</i> , auct. <i>partim</i>). | <i>cratægicola</i> , Först. (<i>nec</i> Linn.). |
| contains no British species.] | <i>rubida</i> , M.-D. |
| | <i>claripennis</i> , M.-D. |
| | <i>viridissima</i> , Scott. |

* I only discovered that the insect described by me as *Ps. pyri* ought to be referred to the *Ps. simulans*, Först., after receiving specimens of the true species from Dr F Löw. As far as the outward appearance of the two species goes, they are extremely like each other, but the falcate form of the processes in *Ps. pyri* at once settles the question, yet we are left in doubt whether Curtis's species was not the *Ps. simulans*, Först., and whether we possess the true *Ps. pyri* in England.

9. *visci*, Curtis.
ixophila, F. Löw.
10. *cratægi*, Först.
pityophila, Flor.
oxyacanthæ, M.-D.
similis, M.-D. (*partim*).
11. *pineti*, Flor.
similis, M.-D. (*partim*).
occulta, Först. ?.
ornata, M.-D.
12. *rhannicola*, Scott.
13. *salicicola*, Först.
rufula, Först.
14. *stenolabis*, F. Löw.
15. *Hartigii*, Flor.
sylvicola, Leth.
16. *Loewii*, Scott.
17. *hippophæis*, Först.
18. *betulæ*, Linn.
elegantula, Zett. ?.
ambigua, Först.
19. *Försteri*, Flor.
alni, Först. (*nec* Linn.).
20. *alni*, Linn.
fuscineris, Först.
Heydenii, Först.
21. *buxi*, Linn.
22. *spartii*, Guer.
spartiophila, Först.
- [SPANIONEURA, Först.
not yet discovered in Britain.]
- [AMBLYRHINA, F. Löw.
contains one species not yet found in
Britain.]
- [DIAPHOBINA, F. Löw.
contains no British representative.]
- LIVILLA, Curtis.
1. *ulicis*, Curtis.
- ARYTÆNA, Scott (Först., *partim*) = (*Atænia*,
Thoms.).
1. *genistæ*, Latr.
ulicis, Curtis, Scott.
spartii, Hartig.

- [FLORIA, F. Löw.
contains no British representative.]
- [ALLÆONEURA, F. Löw., = (*Arytaina*,
Först., *partim*).
contains no British representative.]
- [HOMOTOMA, Guér., = (*Anisostropha*,
Först.).
contains no British representative.]

Sub-family. 4. TRIOZINÆ.

TRICHOPSYLLA, Thoms.

1. *Walkeri*, Först.

TRIOZA, Först.

1. *urticæ*, Linn.
eupoda, Hartig.
forcipata, Först.
protensa, Först.
crassicornis, Först.
bicolor, M.-D.
2. *viridula*, Zett.
simplex, Hartig.
apicalis, Först.
3. *galii*, Först.
velutina, Först., Flor. ?.
thoracica, Flor. ?.
4. *acutipennis*, Zett. (*nec* Först.).
Saundersi, M.-D.
5. *remota*, Först.
cinnabarina, Först.
hæmatodes, Först.
dryobia, Flor.
6. *salicivora* (Reuter), Scott.
7. *albiventris*, Först.
sanguinosa, Först.
8. *munda*, Först.
munda, Flor.
9. *rhanni*, Schrk.
abieticola, Först.
argyrea, M.-D.
10. *abdominalis*, Flor.
11. *Dalei*, Scott.

- [BACTERICERA, Puton.
not yet discovered in Britain.]

I may add that I do not hold with Dr. F. Löw in the position he assigns to the genera *Livilla* and *Spanioneura* in his sub-family *Psyllinæ*. Although the neururation of the elytra of the former is

similar to that of *Psylla*, yet the peculiarity of the form and length of the face-lobes seem to indicate that it ought to be dealt with as a member of a sub-family, to be called *Livillinae*. As for the latter (*Spanioneura*), it is somewhat remarkable in its structure, partaking, as it does, of the characters of *Psylla* and *Trioza* combined. From *Psylla* it differs in having lanceolate elytra, as in *Trioza*; and from *Trioza* in having a petiolate cubitus, as in *Psylla*. Here, also, I think are sufficient grounds for the formation of a new sub-family, under the name of *Spanioneurinae*.

In the "Meddel. af Soc. pro Fauna et Flora fennica," 5 (1880), Dr. O. M. Reuter, in his enumeration of the *Hemiptera* of Åbo and Åland, observes the nomenclature of Dr. Löw in respect of the *Psyllina*, which are mostly the same species as in Britain.

Lee, S.E.: 2nd January, 1882.

ENTOMOLOGICAL NOTES FROM TENERIFFE, ST. VINCENT, &c.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

We arrived at Teneriffe on the 17th December, and on the following afternoon I went for a walk, taking the road from Santa Cruz towards Laguna, in the interior, the ancient capital of the island. The country passed through was very rough, dry, and rocky, the small fields being divided by loose stone walls, reminding one of Malta. The only things under cultivation, at this time of the year, appear to be spring onions and prickly pears. There were a great many acres of the latter, which are grown for the purpose of rearing the cochineal insect. In one place there were a number of women busily engaged covering the leaves with muslin. The parent insects, so I was told, are kept in sheds, built for the purpose, and deposit their ova on the muslin, which is then cut into pieces about six inches square. These pieces are then wrapped round a leaf of the prickly pear, and their ends fastened to the leaf with the sharp thorns picked from the plant itself. The little creatures when they are hatched crawl from the muslin on to the leaf, and the muslin afterwards serves as a protection from wind and rain. The insects take three or four months coming to maturity, when they are shaken off, baked, and dried, and are then ready for exportation. There are two "crops" in the year, but the first is generally a light one.

Laguna is some 2000 feet above Santa Cruz, from which it is distant about seven miles, so it was uphill work, and, as I did not feel inclined to go the whole way, I stopped, after walking about four miles, and rested, and admired the beautiful view, and then returned to the town. As I did not expect at this time of the year to see any insects about, I took no net with me, so, in consequence, noticed many large dragon-flies, two or three *Macroglossa stellatarum*, and a number of *Pieris Daplidice*, and also picked up an uninteresting-looking *Noctua* larva, much resembling that of *Agrotis exclamationis*,* crawling on the dusty road. The next morning I landed with one of my brother officers for a drive to Laguna, and upon reaching the mole, we found a carriage which we had previously ordered waiting for us. It was a queer-looking conveyance, of ancient date, and had three horses attached to it abreast. The day was simply perfect: cloud and sunshine, the latter preponderating, with a deliciously balmy breeze. The road between the two towns was a capital one, and our three little horses took us along merrily, although it was uphill the whole way. We reached Laguna about half-past one, and found it a dreary, dirty-looking town, with much grass growing in the wretchedly-paved streets. After driving about in the town for a short time, we went right through and found the country beyond flat and well cultivated, and in some places looking beautifully green. We drove on for about a mile between something almost like hedges, and then stopped, got out, left our carriage in the road, and walked about for an hour or so. I put my net together at once, and had only just done so when a brown butterfly flitted by, and was netted, and I was pleased to find that I had captured a fine *Lasiommata Xiphia*, and seven others were soon obtained. They were evidently just coming out, for they were quite fresh and in beautiful condition. Besides these, *Pieris rapæ* and *Daplidice* and *Chrysophanus Phlæas*—the latter with much larger black spots than in British examples—were taken, and several *Pyrameis cardui* seen. The country this side of Laguna was very pretty, and after walking on until we could see the sea the other side of the island, we returned to our carriage and drove back to Santa Cruz.

On 24th December, we arrived and anchored off the estuary of the river Ouro, on the West Coast of Africa, in lat. 23°, 40' N., and remained until the 29th. This locality, I expect, has never been visited by an entomologist; and from the ship, entomologically speaking, the aspect was most desolate, nothing as far as the eye could reach but

* On the 16th January this larva produced a fine *Agrotis*, unlike any species with which I am acquainted.

sandy desert—in fact, the great Sahara. While here I went on shore several times shooting (birds were very numerous), and found the country was no better than it appeared from the ship: stunted bushes of mesembryanthemum, saltwort, stonecrop, &c., grew at intervals on the sandy beach, and on the desert beyond, the same plants, in a more dwarfed form, and a few others I did not know, occurred. A diligent search at the roots of these plants resulted in the discovery of one small beetle (a *Dermestes*) and the larva of another (*Cicindela*), and a few larvæ of an Orthopteron. But a large dragon-fly (*Anax* [*Cyrto-soma*] *ephippiger*) occurred in the greatest profusion, which is strange when one bears in mind that these insects in their larva-state pass their existence in fresh water, of which there were no signs whatever in the neighbourhood, nor had there apparently been any rain for months. The river Ouro seems to be a river in name only, for an exploring party from the ship which went to the head of the estuary—some twenty miles or more inland—could discover no trace of fresh water. These dragon-flies flew off to the ship in considerable numbers, and at night might be seen reposing on the various ropes. One evening, shortly before dusk, I landed on the sand-ridge, at the mouth of the estuary, and found the dragon-flies had congregated in vast numbers on the bushes, and I noticed that they invariably selected the branches to leeward of the bush.* Only one species of butterfly, the ubiquitous *Pyrameis cardui*, was noticed. No traces of the ordinary food-plants were visible. Three different kinds of moths were obtained: a fine *Charocampa celerio* at rest (the larva of this insect feeds, I believe, exclusively upon vine); *Heliothis armiger*, whose larvæ I have taken feeding in flowers of thistles and henbane; and an *Agrotis*, near *ripæ*, whose larvæ, probably, feed on *Sedum*, and other plants growing on the sands.

We left the river Ouro on 29th December, and arrived at St. Vincent, Cape de Verde islands, on the afternoon of 2nd January. From previous accounts I had had of the island, I expected to find nothing but a barren, dry rock, so was agreeably surprised to see an abundance of green scrub to the westward of the town, and plenty of green and golden patches among the hills. The next day I went on shore, and walked out to the westward of the town, where I found that the scrub was composed chiefly of tamarisk with mimosa and cassia, and several other trees and shrubs I did not know. The golden-

* The name of this dragon-fly has been supplied by me, from a specimen forwarded by Mr. Mathew. It is essentially a migratory species, sometimes flying over to the European shores of the Mediterranean, from Africa, in large swarms; this will account for its appearance in such numbers in a place in which it could not have been bred.—R. McLACHLAN.

green patches were caused by a densely growing *Sedum*, whose bright yellow and sweetly smelling flowers were just coming into bloom. There were also large patches of *Chenopodium* growing luxuriantly among the tamarisk and elsewhere, and near the shore *Suaeda maritima* and *Beta maritima* in plenty. Among the *Chenopodium*, a *Pyrale*, which seems identical with a species I have taken in Peru, was abundant, and I also obtained a single example of another species of *Pyrale*, which I have likewise taken both in Brazil and Peru. Unfortunately, it was a dull afternoon, with frequent misty showers, and only a gleam of sunshine at rare intervals, and a strong breeze blowing. It always blows here, I believe. During the gleams of sun, I noticed two kinds of butterflies: a *Pieris*, which looked uncommonly like *rapæ*, and which I missed shamefully several times, and two specimens of an obscure little *Lycæna*. Among the *Chenopodium* I obtained five small and prettily marked *Pterophori*, and from the tamarisk bushes a plume which appears to be identical with *Agdistis Bennetti*.* Among the same bushes there were numbers of a dull coloured *Scoparia*, and a very small whitish *Tinea*, but the moment they were dislodged with the beating stick, they were blown away by the strong wind, and I was only able to secure a couple of them. Two species of dragon-flies were plentiful, but also, on account of the wind, difficult to catch, and I obtained but two—one possessing a bright claret coloured body, and the other dull golden-green—perhaps, sexes of the same species. Besides the moths mentioned above, I secured a pretty little yellow *Noctua*, allied to *Micra*, and two species of *Geometer*. In the seed-pods of *Cassia*, a *Tortrix* larva was plentiful, and I gathered a couple of dozen of them.† *Coleoptera* and *Hemiptera* were very scarce, but *Orthoptera* were abundant, and I noticed many species, besides hearing them all around me. The *Hymenoptera* were represented by a single large, dark blue, ichneumon-like insect, having large, bright yellow antennæ, which made it very conspicuous on the wing. They were busy collecting honey from the flowers of the *Sedum*. We left St. Vincent on the 4th January for Cape of Good Hope, where we shall remain for about a fortnight, and then proceed to Australia.

H. M. S. "Espiègle," at Sea:

27th January, 1882.

* *A. tamaricis*, ?.—Ebs.

† I placed these pods in a large wide-mouthed bottle, and in a day or two observed many of the larvæ had crawled to the sides of the bottle and were hanging, dead, and, upon examination, I found all the pods covered with mildew, and every larva dead. One which I placed in a small pill box by itself, for the purpose of figuring, spun a cocoon of fine white silk, and on the 20th January produced a moth.—G. F. M.

Note on Acherontia Atropos in Caithness.—In March, 1877, a correspondent of the Ent. Mo. Mag. made enquiry about the occurrence of *Acherontia Atropos* in Caithness. In the Ent. Mo. Mag. for the following month I mentioned the only instance then known to me. Perhaps it may interest Mr. Sandison to hear that it has been taken twice since then, and on both occasions by chance observers. In August, 1877, a specimen was found at rest in the daytime in a grass field adjoining one of potatoes, at Billster, near Wick; and in August, 1879, another was startled out of ivy at Barrock House, in the parish of Bower. No doubt the insect occurs occasionally throughout the county.—L. D. DUNBAR, Wick, N.B.: Feb. 17th, 1882.

Further note on Tortrix Lafauriana.—I have just had the pleasure of examining a series of variations of both sexes of *Tortrix Lafauriana*, Ragonot, kindly lent for the purpose by Mr. Atmore, and am able to add a few words to my note on the species (*ante* p. 17). In the males the range of variation here seems to be from the usual yellowish or pale ochreous colour to a bright fulvous, the markings slightly darker, or even almost obliterated. Females either very pale ochreous, greyish-ochreous, or dull brownish-red, in all cases having the fore-wings crossed by numerous irregular, delicate, faintly darker lines, something as in the female of *Lozotænia rosana*, giving the wings a faintly reticulated appearance. This also occurs, but more faintly, in the males.

By good fortune, at the same time, my old friend, Mr. Machin, has sent me a pair of *Tortrices* reared by him from *Statice limonium*, which are clearly *L. latiorana*, Wilk. (a variety of *L. costana*), the female of which resembles the paler females of *Lafauriana* in shape, size, and colour, but is entirely destitute of the delicate reticulations of that species, and is thus easily distinguishable.—C. G. BARRETT, Pembroke: February 25th, 1882.

On the colouring matter, &c., of cocoons of some of the silk-spinning Lepidoptera.—I have been much interested in reading an article in the "Journal of Science" for last month (February, 1882), by Mr. J. W. Slater on "Silks and Silkworms," and my attention was especially caught by the part where the statement of Major Coussmaker, who has studied the large Indian silk-spinning larvæ, is quoted to the effect that by opening cocoons at various intervals he had convinced himself of the fact "that when the caterpillar has left off eating and begins to spin, it voids the food remaining in the alimentary canal, first of all in a more or less solid form and of a dark colour, but after it has become fully enveloped in the cocoon, the excrement comes away as a light-coloured liquid, the hue and consistency of which depend upon the amount of vegetable matter not previously evacuated, and the amount of lime, carbon, and ammonia present:" and he considers the use of this excrementitious deposit is to harden the cocoon, but at the same time it stains the silk, and it is from this point of view chiefly that he takes notice of it. Now to me at first, when I recollected the invariable habit of larvæ to empty the intestine of food before commencing the cocoon, this statement seemed sufficiently startling; but presently the yellow powder in the cocoon of *Clisiocampa neustria* came to mind, and could not be accounted for as emanating from the spinnerets of the larva; so I turned to Kirby and Spence, and found of course that they had not omitted to speak of this habit, but after mentioning it as belonging to *C. neustria* and *Liparis salicis*, they

proceed to give the explanation that these larvæ, "after spinning their cocoons, cast from their anus three or four masses of a soft and paste-like matter, which they apply with their head all round the inside of the cavity, and which, drying in a short time, becomes a powder that effectually renders it opaque. This is not as might be expected an excrement, but a true secretion, evidently intended for this very purpose, and according to Réaumur, a similar powder, but white, derived from the varicose intestines, is used by the caterpillars of *Gastropacha quercifolia*, &c." And I find in Boisduval's introduction to the first vol. of "*Lépidoptères, Suites à Buffon*," the following passage: "Il en est qui, pour rendre leur coque plus ferme et moins transparente, l'humectent d'une liqueur jaune qu'elles rendent par l'anús, et qui, en se desséchant, devient pulvérulente comme du lycopodium ou de la fleur de soufre (*Bombyx neustria, franconica, castrensis*, &c.)"

Besides the powdery cocoon of *C. neustria*, I had bethought myself of the varnished cocoon of *Saturnia carpini*, and on this point also I find something in Kirby and Spence, for they quote a conjecture of Réaumur that the threads of which it is made are connected by a "gummy matter from the anus, with which the whole interior of the cocoon is often plastered."

I have myself bred very few indeed of the large Oriental silk-spinners, and I have not sufficient physiological knowledge to speak with anything like authority on the substances other than silk, which are found in the cocoons of the above mentioned British species, but I must say of the two explanations given I prefer the one which attributes them to a secretion, to that which gives them an excrementitious origin. Perhaps there may be some one who has investigated this subject recently, and can settle it for us; if not, it seems sufficiently interesting to be examined anew, and I shall be glad to help any one able and willing to make experiments.

The cocoons of some of the ichneumous, as noticed by Kirby and Spence, offer curious examples of variation in the colour of silk, which must all come from the same source; some of these cocoons are regularly *banded* in two colours, others, as Mr. Parfitt made me observe, are *spotted*, and some I have seen almost *streaked*; here would be another interesting subject for examination by a competent student.—
J. HELLINS, Exeter: 10th March, 1882.

Corticaria Wollastoni at Mablethorpe, &c.—Last summer I took on the sand-hills at Mablethorpe, Lincolnshire, several specimens of a *Corticaria* which I thought might be *Wollastoni*, Waterhouse, as it seemed strange, and I knew that Mablethorpe was the place where Mr. Wollaston took the specimens from which the insect was named; on comparing my specimens with the type specimen of *Wollastoni* given me by Mr. Matthews, I found that they were identical. I sent, however, one of my specimens to M. Brisout de Barneville, who returned it to me as *C. transversalis*, Gyll., a species very common on the continent, and apparently one of the most variable of the genus. I find that Reitter, in his Monograph, has already merged *Wollastoni* into *transversalis* as a variety; and although he has done this only from descriptions, and owns that *Wollastoni* is unknown to him, yet there would seem to be little doubt but that he is right. The following continental species, that have at one time or other been described, are all now included under *transversalis*: *brevicollis*, Mannh., *maura*, Mots., *hortensis*, Mannh., *Wollastoni*, Waterh., *suturalis*,

Mannh., *crocata*, Mannh., *taurica*, Mannh., *curticollis*, Mannh., *pallens*, Mannh., *moravica*, Reitter, *albipilis*, Reitter, *sericea*, Mannh. This fact will show how variable the species is.

Our *C. curta*, first described by Mr. Wollaston (Ins. Madeira, 1854), appears to be the same as *C. fulvipes*, Comolli, described in 1837; the latter name, therefore, has priority.—W. W. FOWLER, Lincoln: *March 9th*, 1880.

Oryctes nasicornis at Wick.—Will any correspondent, who knows of the capture of the continental *Oryctes nasicornis* in Britain, tell me when and where it occurred? In May, 1879, between the 18th and 31st, a female *O. nasicornis* was taken crawling on the South Head Braes, Wick, and brought to Mr. Sinclair, watchmaker, by whom it was given to me. As it is common in gardens, tan pits, &c., in northern and middle Europe, it doubtless came in the ballast of one of the many vessels which trade between the Baltic ports and Wick. Mr. E. C. Rye kindly named the insect for me shortly after it was taken.—L. D. DUNBAR, Wick, N.B.: *February 17th*, 1882.

Notes on captures of British Aculeate Hymenoptera.—I should be glad if you would allow me space to record the following captures of some of our rarer British Aculeate Hymenoptera. The species mentioned were taken some years ago, before I first left England, and I only call attention to them now because I find that the localities here given for the *Fossores*, &c., have not been mentioned by Mr. E. Saunders in his Synopsis, and as some are for species of considerable rarity, I thought it was a pity that they should be forgotten; I have also added localities for several rare wasps and bees, and would especially call attention to the capture of *Odynerus basalis* on Stowborough Heath, Dorset, for although my kind old friend, the late Mr. F. Smith, described and figured it in the Entomologist's Annual for 1869, he, in some unaccountable way, omitted it from his Catalogue published in 1871. It has, I believe, been subsequently taken by Mr. C. W. Dale, also in Dorsetshire.

Formica sanguinea, Shirley, Croydon, common, one nest in the post of an oak paling sunk in the ground; *aliena*, Bournemouth, ♂ ♀, July. *Myrmica lobicornis*, *Leptothorax acervorum* and *Nylanderi* (a few specimens), Shirley, Croydon, in nest of *F. sanguinea*, common. *Tetramorium caespitum*, Shirley. *Mutilla europæa*, Croydon and Bournemouth; *rufipes* = *ephippium*, entirely black var. of the ♂, one specimen, Sandown Bay. *Aporus bicolor*, four ♂, three ♀, Steeple, Ventnor, July, 1871, first recorded capture of the ♂ in this country.* *Agonia variegata*, Steeple, Ventnor, July. *Pompilus agilis*, Ventnor. *Tachytes unicolor*, Ventnor. *Crabro capitosus*, Ipswich, bred from bramble-sticks. *Eumenes coarctata*, Bournemouth and Stowborough Heath. *Odynerus basalis*, ♀, first captured on Stowborough Heath, Dorset, 24th July, 1878. *Tespa norvegica*, Shirley. *Andrena Hattorfiana*, Ventnor; *spinigera*, Shirley; *austriaca*, = *rosæ*, Shirley; *simillima*, Ventnor. *Calioxys 4-dentata*, Ipswich, common. *Osmia bicolor*, Riddlesdown, near Purley, May; *pilicornis*, Shirley, 1 ♀. *Nomada laccata*, Bournemouth; *armata*, Ventnor. *Stelis phæoptera*, Addiscombe, not uncommon. *Ceratina cyanea* = *cærulea*, Croydon, bred from bramble-sticks. *Bombus soroensis*, ♂ and ♀, Croydon and Ipswich.—G. A. JAMES ROTHNEY, 84, Anerley Park, Penge, S.E.: *9th March*, 1882.

* Mr. Rothney has given me an opportunity of examining these specimens, and also very kindly added a pair of this great rarity to my collection.—E. S.

Note on Trioza crithmi, F. Löw, a species of *Psyllidæ* not yet known as British.—Where “hangs (out) one that gathers samphire?” If there be such an one, he is the very person to direct the footsteps of the naturalist to the head quarters of this insect, discovered by Dr. Puton on the sea coast in Brittany some time ago, and who wrote to me immediately after its capture, saying, that it was certain to be found in England where the plant grew. I hope some enterprising individual will try and obtain the species, and be good enough to send me living examples, together with a small portion of the food-plant, for the purpose of figuring. Nothing is, I believe, as yet known of its earlier stages, and the young forms would prove of much greater interest than the adults.—JOHN SCOTT, Lee, S.E.: *March 12th*, 1882.

Note on some fungi that attack insects, &c.—*Isaria arachnophila* is parasitic upon dead spiders, *I. farinosa* on dead pupæ, *I. sphingum* on dead moths. These creatures are, however, first attacked whilst living. The genus *Isaria* is supposed to be a sort of conidophorous, or larval, condition of the genus *Torrubia* (or *Cordyceps*) amongst fungi. Several British species of this latter genus grow on the larvæ or pupæ of moths, one grows on an ichneumon, and another (*Cordyceps sphærocephala*) upon living wasps in the West Indies; this last species seems to have no place at present in the lists of British fungi, yet it seems probable that the fungus now exhibited growing from the body of a bee, is no other. The bee was caught in this country whilst it was inconveniently flying with its fungus burden.—WORTHINGTON G. SMITH (extracted from a paper read at Sci. Committee R. Hort. Soc., *14th March*, 1882).

Review.

REPORT OF THE ENTOMOLOGIST OF THE UNITED STATES DEPARTMENT OF AGRICULTURE FOR THE YEAR 1880. By J. HENRY COMSTOCK. With Illustrations. Washington: Government Printing Office. 1881. (Author's Edition) pp. i—iv, 235—373.

The primary object of this Report is to give notes on insects injurious to various plants or crops in America, with indication of the remedies, and in this respect is likely to be beneficial; but it has a wider interest for Entomologists in the accounts of the natural history of the insects noted, and in the descriptions of new species. The Report is divided into three parts: 1, Miscellaneous Insects; 2, Report on Scale Insects; 3, Report on the Parasites of the *Coccidæ*.

The first part is mainly devoted to *Lepidoptera* from an economic point of view, and three new species are described: *Pempelia Gleditschiella*, Fernald, from leaves of the honey-locust; *Grapholitha bracteata*, Fernald, from cones of *Abies bracteata*; and *Botys repetitialis*, Grote, from cauliflowers. Two other new insects are also described—*Diplosis catalpæ*, Comstock, and *Entedon diastatæ*, Howard. Plates i and ii belong to this part.

Part 2. This consists of a Report on *Coccidæ*, preceded by an introductory notice, in which are well and concisely given their characters and metamorphosis, to which are added statements of methods for the destruction of these very injurious insects, the preference being given to a solution of soap, the author saying—“The

results were so remarkable, that I feel warranted in saying that, taking into consideration its efficacy as a means of destroying scale-insects, its effect upon plants, and its cost, there is at this time no better remedy than a strong solution of soap. In my experiments whale-oil soap was used, and the solution was applied by means of a fountain-pump to orange trees infested with the red scale of California. In the strongest solution used the proportions were three-fourths of a pound of soap to one gallon of water. The mixture was heated in order to dissolve the soap thoroughly; and the solution was applied while yet heated to about 100° F. The tree upon which the experiment was made was very badly infested, the bark of the trunk being literally covered with scales. Four days after I examined the trees very carefully, and could find no living insect on the trunk, and only a small proportion of the Coccids on the leaves appeared to be still alive. Three months afterwards Mr. Alexander Craw made a careful examination of this and some other trees upon which we had experimented, and on this one he was unable to find any living scale insects."

Pages 292 to 349 are occupied with descriptions of species, some of which are well-known European forms, some American, previously known, and more new and now first described and figured. Plates iii to xxii are devoted to the *Coccidæ*.

Part 3 is a Report on the Parasites of the *Coccidæ*, contributed by Mr. L. O. Howard, in which the fostering of them with a view to their beneficial action in lessening the number of *Coccidæ* is shown to be practicable and is advocated. Thirty-four species (*Chalcididæ*, *Proctotrupidæ*) are described, most of them being new, and Plates xxiii and xxiv are filled with figures of them.

Altogether this is one of the best of the Reports by the State Entomologists of America we have seen.

Obituary.

Sir Charles Wyville Thomson, LL.D., F.R.S., died at his residence, Bonsyde, Linlithgow, on the 10th March, at the age of 52.

In early life he collected British *Lepidoptera*, and there is a communication from him in the 4th volume of the Entomologist's Weekly Intelligencer, p. 117, on the occurrence of "*Anthrocera Minos* in the West of Scotland."

Professor Wyville Thomson was then (1858) at Queen's College, Belfast, where he remained till 1870, when succeeding Professor Allman in the Chair of Natural History in the University of Edinburgh, he entered on a wider sphere of usefulness.

His connection with the "Challenger" expedition as head of the Scientific Staff is well known. Leaving England in 1872, they were away three years and a half; on his return from that voyage in 1876 he was knighted.

Unfortunately, he seems never to have enjoyed good health after his return from this expedition. In June, 1879, he had an attack of paralysis, and from that time he could only work at occasional intervals, and towards the end of last year he resigned his Chair at the University of Edinburgh, and latterly he found himself physically unable to continue his personal superintendence of the volumes which have yet to appear relating to the expedition.

Another attack of paralysis occurred early in March, which speedily had a fatal termination.

ANNOTATED LIST OF BRITISH ANTHOMYIIDÆ.

BY R. H. MEADE.

(continued from page 224.)

16. HYLEMYIA, R. Desv.

Gen. ch.—Eyes bare, contiguous or sub-contiguous in the male; arista plumose, or sub-plumose; alulets small, with scales of equal size; abdomen usually prolonged with five segments, conico-cylindrical, or oblong flattened and narrow; the ventral surface often furnished with tufts of hair, and the anal male appendages prominent: wings with the third and fourth longitudinal veins parallel, or slightly divergent; anal vein prolonged to the margin: legs simple.

Sect. 1—*Legs wholly or nearly black.*Div. i—*Arista long haired.*

- | | |
|--------------------|---------------------------------|
| 1. HILARIS, Fall. | 4. LASCIVA, Zett. |
| 2. VIRGINEA, Meig. | 5. FLAVIPENNIS, Fall. |
| 3. VARIATA, Fall. | <i>crassirostris</i> , Meig. ♀. |

Div. ii—*Arista short haired.*

- | | |
|-----------------------------|----------------------------------|
| 6. SETICRURA, Rond. | 9. PULLULA, Zett. |
| 7. CARDUI, Meig. | <i>longula</i> , Meig. non Fall. |
| <i>brunnescens</i> ?, Zett. | 10. CINERELLA, Meig. non Fall. |
| 8. NIGRESCENS, Rond. | 11. CINEROSA, Zett. |
| | 12. ANTIQUA, Meig. |

Sect. 2—*Legs more or less pale.*Div. i—*Arista long haired.*

- | | |
|-------------------------|----------------------|
| 13. STRIGOSA, Fab. | 16. PUELLA, Meig. |
| <i>vulgaris</i> , Panz. | 17. OPEROSA, Meig. |
| 14. NIGRIMANA, Meig. | 18. COARCTATA, Fall. |
| 15. PRÆPOTENS, Wdm. | |

Div. ii—*Arista short haired.*

19. TIBIARIA, Rond.
ceparum?, Meig.
antiqua?, Schin.

The distinctive characters between the species in this genus, and those in *Hydrophoria*, are somewhat difficult to define; the only positive point of difference being the comparative size of the scales of the alulets, which are unequal in size, and larger in proportion, in *Hydrophoria* than in *Hylemyia*. Schiner has repudiated the genus *Hydro-*

phoria altogether, placing *H. conica* and *H. linogrisea* in *Hylemyia*, and removing *H. divisa* into the unspotted division of his genus *Spilogaster* (*Mydæa*). While, however, some of the more highly developed species of this genus are closely related to some of those in *Hydrophoria*, many of the others are very feebly organized, having very small alulets and narrow flattened bodies.

The arista should always be distinctly plumose or hairy in all species placed in this genus, but there are a few in which the hairs though distinct are short, and some of these have been placed by one author in one genus, and by others in another, thus creating a good deal of confusion: *H. antiqua* and *pullula*, for instance, are included by Schiner in his great genus *Anthomyia*, along with *H. cardui*; while Rondani places them more correctly in the present genus.

H. HILARIS, Fall.

This fire well-marked species is rare. I have only seen one British example, which was sent to me by Mr. B. Cooke, of Southport.

H. VIRGINEA, Meig.

This large species is also rare. I captured a single male in August, 1873, at Tiringwick, near Buckingham. The legs, though black, have all the knees as well as the bases of fore tibiæ pale.

H. VARIATA, Fall.

This little species, which abounds everywhere, may be recognised by its narrow conico-cylindrical abdomen, marked by a slender longitudinal dorsal stripe, which becomes attenuated towards its extremity; and by the arista being furnished with very long but few hairs. The thorax is striped by three, or rather five longitudinal black bands, which are more distinct in the female than in the male. The forehead is prominent, the eyes contiguous behind in the latter sex, but rather widely separated in the former, the frontal space being rufous at its fore part.

H. LASCIVA, Zett.

This species is almost as common as the last, and is often confounded with it; it differs, however, by being rather smaller, much blacker, and more hairy. The thorax is indistinctly striped; the abdomen is flat and oblong, not conical; the sub-anal processes are much larger; the dorsal stripe is wide and of equal width over each segment, except the last, on which it is indistinct; the head is round, and the forehead less prominent than in *H. variata*; the arista is very similar.

Length, about 4 mm. (2 lin.).

H. FLAVIPENNIS, Fall.

In this species the arista is long and thickly haired; the proboscis is thick and fleshy, especially in the female; hence the name given to it by Meigen, who only knew that sex. The thorax is nearly black and indistinctly striped; the abdomen

is dark grey, cylindrico-conical, hairy, with an interrupted dorsal stripe, formed by three widish tapering black spots; the wings are of a brownish-yellow colour, more intense at the base; the hind tibiæ of the males are clothed along their front and inner surfaces with soft hairs of moderate length. The female has the frontal space black, and the abdomen nigrescent and immaculate. Rather local, not uncommon in Yorkshire, and I have received it from Mr. Dale, in Dorsetshire.

H. SETICURA, Rond.

This well-marked species has only been described by Rondani. It is characterized by the arista being rather shortly but thickly haired; the face slightly prominent; the eyes of the male contiguous; the proboscis thick, as in *H. flavipennis*; the thorax yellowish-grey, with five longitudinal stripes; the abdomen oblong, flattened, very hairy, ash-grey, with a narrow longitudinal stripe; the sub-anal appendages of the male large, and furnished in front with two projecting hairy lobes; the wings sub-luteous; the legs spinous; and the hind tibiæ thickly armed with long rigid hairs, or fine bristles, along the whole of their inner and front sides. The females, which were unknown to Rondani, have the eyes separated by a wide space, having a central red stripe, bordered by a white margin on each side about half the width of the stripe; the thorax marked as in the male; the abdomen brownish-grey, conical, hairy, and immaculate; the wings nearly colourless, strongly ciliated along the front half of the costa, and with a long costal spine (the costa is nearly smooth in the male). The legs are spinous. Generally distributed.

Length of both sexes, about 6 mm. (3 lin.).

H. CARDUI, Meig.

The diagnosis of this species is involved in a good deal of obscurity. It was not known to either Zetterstedt or Rondani; the former, however, probably confounded it with his *A. brunnescens*, for the descriptions of the two species correspond pretty closely, and in his last volume he remarks that Dr. Winnertz in 1856 sent him a specimen of *A. brunnescens* under the name of *Anth. cardui*, Meig.

I have not seen a typical example of *H. cardui*, but shall give a short account of the British species, which appears to me to correspond most closely to the descriptions given by Meigen and Schiner of that insect.

Eyes of male sub-contiguous; face sub-prominent, white with brown reflexions; epistome unprojecting; arista with short hairs, and having a shining black, short, oval prominence at its base; thorax brownish-grey, with greyish-white sides, marked with three longitudinal black stripes, one central, straight, diminishing in breadth from before backwards, and two lateral, sinuous and irregular; the stripes are separated by two rows of bristles, which give the thorax the appearance of being five striped; addomen long, narrow, depressed, and hairy, with the second segment prolonged, ash-grey with black reflexions, marked with a black interrupted longitudinal dorsal stripe, and transverse lines; the sub-anal process of the male is furnished with two projecting lobes, and there is a tuft of shortish black hairs on the under-surface of the middle abdominal segment; wings yellowish-brown, the third and fourth longitudinal veins parallel to each other behind the external transverse vein; fore tibiæ with one bristle projecting from the middle of the external

surface, in addition to the apical ones ; hind tibiæ with a few short bristles on their inner surfaces, and five or six longer ones, of even lengths, arranged along the outer sides, at nearly equal distances from each other. I do not know the female.

Length of male, 6 mm (about 3 lin.).

This species seems local. I captured a number of specimens near Risborough, in Buckinghamshire, in June, 1879, but have not met with it in any other locality.

H. NIGRESCENS, Rond.

This species closely resembles the last, and may easily be confused with it ; it is, however, distinct, and may be known from *H. cardui* by the following points of difference : the eyes of the male are contiguous, the epistome slightly prominent, the arista has rather shorter hairs, and has a slightly prolonged thickening at the base instead of a bead-like prominence, as in *H. cardui* ; the thorax is indistinctly striped and less white on the sides than in *H. cardui* ; the third and fourth longitudinal veins of the wings are slightly divergent ; the fore tibiæ are without any spines on their outer surfaces, besides the apical one ; the hind tibiæ are more spinous externally than in *H. cardui*, and the spines are placed in irregular order. The female is unknown. Rare. I have two males captured in the neighbourhood of Bradford, and have received typical specimens from the continent.

H. PULLULA, Zett.

This little species may be known from all the others in the genus by the transverse veins of the wings being slightly clouded with black. Not uncommon.

H. CINERELLA, Meig.

This species is quite distinct from the *M. cinerella* of Fallén, with which Meigen confounded it ; the latter species has the arista nearly bare, and belongs to the genus *Chortophila*. The present insect has the arista distinctly plumose, though rather short-haired ; the face is somewhat prominent ; the eyes of the male sub-contiguous ; the dorsum of the thorax blackish-brown, with an indistinct central stripe, and an irregular black line on each side, below which the sides are of a grey-white colour ; the scutellum is pale grey ; the abdomen is long, narrow, and conical, grey, with a narrow longitudinal dorsal stripe ; the hind legs are long, with the tibiæ spinous ; a few short spines being situated on their inner sides in the middle. Rare. I have three males which were found near Bradford, and I have also received it from Austria.

H. CINEROSA, Zett.

This, though supposed by Zetterstedt to be the same as the *A. cinerella* of Meigen, is quite distinct. The face is less prominent ; the thorax (with the scutellum) is of an uniform greyish-brown colour ; the sides are pale, but are not separated from the dorsum, as in the former species, by a black line ; the abdomen is oblong and flattened, of a dark grey colour, and marked on the dorsum with four wide sub-confluent triangular black spots, instead of with a straight narrow line ; the hind legs are proportionately shorter than in *H. cinerella*, and the hind tibiæ are clothed on their inner sides with soft hairs instead of bristles ; the wings are tinged with yellow in both species. Not common. I captured five males near Lake Windermere in June, 1874.

H. ANTIQUA, Meig.

This rare species, of which I have seen but one British example, has been confounded with several others. It is shortly but clearly described by Meigen (vol. v, p. 166). The thorax is yellowish-grey with white shoulders, and is unstriped; the abdomen is flattened and elliptical, ash-grey, with a very fine, straight, sub-interrupted dorsal black line; the hind tibiæ are spinous. I have typical continental specimens of this fly named by the late Professor Rondani.

H. STRIGOSA, Fab.

This is common everywhere in woods; it has the tibiæ only piceous in the males, and the femora, as well as the tibiæ, pale in the females.

H. NIGRIMANA, Meig.

This species closely resembles the last, but is usually rather larger, and has the four posterior femora of the males, as well as all the tibiæ, pale. The females are difficult to distinguish from those of *H. strigosa*. Generally distributed, but not common.

H. PRÆPOTENS, Wdm.

This fine species has all the femora and tibiæ yellow in both sexes; the anal segment of the abdomen, as well as the sub-anal male appendages, are also yellow; the wings have the third and fourth longitudinal veins strongly divergent, and the external transverse veins very oblique and sinuous. Rare.

H. PUELLA, Meig.

This species closely resembles *H. virginea*, but has all the tibiæ testaceous, while in *H. virginea* only the bases of the fore tibiæ are pale. These two species are probably only varieties of the same. Rare.

H. OPEROSA, Meig.

This species, of which I only know the female, is characterized by having the thorax, which is brown, marked by two wide irregularly (maculiform) shaped lateral stripes, and two narrow central lines, the sides being cinereous; the abdomen is conical, grey, and has a central dorsal stripe; the legs have all the femora black, but the tibiæ testaceous in both sexes. The female has the intraocular space black, except at the front margin, where it is red. Length, 4 mm. (about 2 lin.).

This fly, which is rare, bears a strong resemblance to *Hydrophoria conica*, but is much smaller and has little alulets.

H. COARCTATA, Fall.

This is a well-marked species; the arista is furnished with hairs of medium length; the males have the thorax grey with the sides lighter, and the dorsum indistinctly striped; the abdomen hairy, oblong, narrow, flat, and cinereous, with an indistinct narrow dorsal stripe; anal segment grey, sub-anal appendages hairy, with two black lamellæ; wings with yellow veins; legs black, with pale tibiæ. The females have both the thorax and abdomen pale ash-grey, and immaculate, and the

four posterior femora, as well as all the tibiæ, pale. Not common. I found several specimens in the neighbourhood of Edinburgh in August, 1875, and have received it from Mr. B. Cooke, of Southport.

H. TIBIARIA, Rond.

This peculiar species bears a very strong general resemblance to *H. cardui* in the colour, shape, and markings of the thorax and abdomen. It differs in having the arista rather longer haired; the tibiæ all piceous or testaceous, and above all in having the abdomen furnished in the middle of its ventral surface with a tuft of black hairs, so long that it extends in a curved direction backwards as far as the apex of the abdomen, and even sometimes beyond it.

Length, 7 mm. (about $3\frac{1}{2}$ lin.).

The female is unknown. Not common. I have captured it at Thorpe Arch, near York. This species is probably identical with the *H. penicillaris* of Rondani, which I have not seen; the only difference between them appears to be that the legs are wholly black in the latter.

(To be continued).

DESCRIPTION OF A NEW SPECIES OF *LIBURNIA*.

BY JOHN SCOTT.

Of finding new *Liburniæ* there appears to be no end; their numbers increase so rapidly. In the same lot from which the under-mentioned has been extracted, I believe there are at least two other new species. My collection being for comparison of no use, I, as a rule, when at a loss in this group, submit the doubtful example to M. Lethierry, the fortunate possessor of Dr. Fieber's collection, for identification. The following is a portion of the result of his kind investigation at this time.

LIBURNIA INSIGNIS, n. sp.

♂. Brachypterous. Pale yellowish. Crown about as broad as long, not projecting beyond the front of the eyes. *Elytra* reaching to about the middle of the abdomen, apical margin flatly rounded. Abdomen pitchy-black, posterior margin of the terminal segment broadly white; genital segment, viewed from the side, produced into an angular form posteriorly, and having a short, curved, acute tooth at the lower extremity.

Head: crown broad; breadth about equal to the length, basal foveæ distinct but not deep, the triangular space in front enclosed between the keels barely extending to the frons, anterior margin slightly convex, not projecting beyond the front of the eyes: face slightly brownish-yellow, broad, slightly narrowed between the eyes, central keel distinct but not prominent: antennæ yellow.

Pronotum: posterior margin flatly concave across the scutellum, side keels short, somewhat indistinct, disc on each side of the centre somewhat depressed. *Scutellum*: keels distinct, somewhat acute. *Elytra* reaching to about the middle of the abdomen, margin at the apex flatly rounded, nerves fine, not granulated. *Legs* yellow: *thighs* at the base fuscous. *Abdomen* pitchy-black, shining, with a large yellow or brownish-

yellow transverse patch on the upper-side at the base, posterior margin of the last four segments very narrowly brown, down the centre of each a short narrow streak, not reaching the anterior margin, posterior margin of the last segment broadly white: genital segment black, shining, viewed from the side the posterior margin is produced into an angular form, and having a short, curved, acute tooth at the lower extremity, viewed from behind almost circular, margins of the upper half folding down inwardly and forming two triangular flaps, leaving a small space between their edges down the centre, processes black, forming a wide V-shaped character, apex of the arms white, produced into a point. Length 1 lin. (Paris), nearly.

The shape of the genital segment is alone sufficient to lead to the identity of this species, viz.: the flat isosceles-angular form of the posterior margin of the segment as seen from the side, and the two triangular flap-like pieces as seen from behind.

I have only seen a single ♂ example taken by Mr. G. Norman, at Pitlochry.

Lee, S.E.: 3rd April, 1882.

NOTES ON *TENTHREDINIDÆ*.

BY P. CAMERON.

(continued from page 195.)

BLENNOCAMPA (MONOPHADNUS) SULCATA, *sp. n.*

Black; covered with a silky greyish or blackish pubescence, which gives the legs a fuscous tinge; apical fourth of anterior femora and tibiæ in front, and the four posterior knees dull testaceous-white. Antennæ thickish, not much longer than the head and thorax; 3rd joint about one-fourth longer than the succeeding. Head with a deep, longish depression behind the eyes, and slightly projecting behind them; frontal area and sutures indistinct; clypeus very slightly incised. Wings smoky, somewhat darker at the base; transverse radial nervure received in apical third of 3rd cubital cellule; transverse median a little before the middle of median cellule; 1st recurrent a little in front of middle of the 2nd cubital cellule; 2nd scarcely so near the middle of the 3rd, and not received in such an acute angle as the 1st; 3rd cubital cellule short and wide, compared with the length, which is a little shorter than the 2nd, on upper side, but longer on lower; there is a "bullæ" on 1st transverse cubital nervure. Claws simple. Abdomen about one-fourth longer than the head and thorax; sheath of saw projecting, its upper side produced into a projecting rounded point, and bearing a few hairs.

The ♂ is similar in coloration, and has the antennæ a very little longer, and the wings if anything clearer. Length, 6—6½ mm.

This distinct species is very closely related to *B. exarmata*, Thoms. (Hym. Scand., i, 207), olim *monticola*, *id.* Opus. Ent., 279, 3, *non* Hartig., but that has the antennæ filiform, and the 3rd cubital cellule elongated, and no mention is made of any peculiarity in the shape of the sheath. From *B. micans*, Klug, it may be known by the eyes not reaching close to the base of the mandibles, by the indistinct frontal sutures and area, by the deep suture behind the eyes, while the head projects

more behind, by the shorter 3rd cubital cellule ; the transverse radial nervure is received further from the 3rd transverse cubital, and consequently the 2nd radial cellule is longer ; and, lastly, in *micans* the transverse median nervure is received in the middle of the cellule ; in *sulcata*, a little in front of the middle. *B. sericans*, again, is larger, has the abdomen longer, compared with the head and thorax, the middle tibiæ and tarsi are distinctly obscure white in front, the antennal forea is larger, there is no suture behind the eyes, while the sheath is not prolonged into a projecting point at the upper part, and the saw is longer and with better marked indentations. As for the common *B. nigrita*, the long 3rd cubital cellule and the short second radial cellule at once distinguish it. *B. monticola*, Htg. = *feriata*, Zad., is also related to it, but may be at once separated by there being no suture behind the eyes, by the short 2nd radial cellule, by the 3rd cubital cellule being double the length of the 2nd, and by the tibiæ being all more or less white at the sides.

Germany (*Prof. Zeller*) ; Holgate, York (*Mr. T. Wilson*), among roses.

Heptamelus ochroleucus, Haliday, Nat. Hist. Rev., 1855, ii, p. 60, pl. ii, f. 1 = *Cænoneura Dahlbomi*, Thoms. Haliday had no doubt of his species being the same as *Melicerta ochroleuca*, Ste., but Stephens' generic description does not agree ; this, however, is a matter of no importance, as it affects neither the generic nor specific name. Haliday's figure and description are excellent. The figure given by M. André, Species des Hymén., i, pl. xv, f. 1, may be that of a new species, but it certainly does not represent *Cænoneura Dahlbomi*, or, as it now must be called, *Heptamelus ochroleucus*.

Strongylogaster viridis, Smiedeknecht, Ent. Nacht., 1881 = *S. delicatulus*. When fresh and newly emerged, *delicatulus* is green, but after death the green colour disappears.

Strongylogaster macula, Klug, is British. I have taken it on ferns on the Kilpatrick Hills, Dumbartonshire.

Glasgow : April, 1882.

TWO NEW SPECIES OF *ICHNEUMONIDÆ*.

BY E. PARFITT.

HEMITELES LITOREUS.

Abdominis medio] *pedibus palpisque stramineo-ferrugineis ; anten-*
narum articulis 1—4 subtus rufis.

Head and thorax black, antennæ black, the basal joints rusty-red beneath, in some, in others entirely rusty-red at the base ; 4 mm. long. Abdomen and thorax

of equal length. Head and thorax sparsely and coarsely punctured, metathorax divided into six areas, coarsely punctured, with a minute tooth on each side. Wings iridescent and slightly smoky-hyaline, stigma dark piceous, radius testaceous-straw-colour towards the base, squamula the same, areole 5 angular. Legs ferruginous, coxæ and trochanters the same, in some specimens the posterior are stained, or are almost black, posterior tibiæ and tarsi entirely dusky. Abdomen depressed, fusiform in outline, or with the sides nearly parallel, basal segment black, narrow at the base, growing gradually wider for about two-thirds, where there are two small protuberances; from these to the apex the sides are parallel and striated. A broad shallow groove runs the whole length. Second and third segments pellucid, straw colour, with a ferruginous stain, the rest more or less stained with black, apex black.

Long., $3\frac{1}{2}$ — $5\frac{1}{2}$ mm. Mas et Fem.

I captured this species by sweeping herbage, *Aster tripolium*, &c., on the sea-shore near Woodbury Road Station, in May, 1881. I have taken it in the Exminster marshes, also near the sea; it is probably parasitic on some larvæ which feed on littoral plants.

MESOLEIUS ELEGANS.

Niger, abdomine rufo nigroque varia, segmentorum marginibus flavis, facie pectore et linea ante alas flavis; pedibus rufis, coxis et trochanteribus flavis, posticis flavo nigroque variis.

Black, head wider than the thorax, buccated behind; clypeus, palpi, and mandibles yellow, the latter ferruginous at the apex, Antennæ nearly as long as the body, the apical half recurved, dull ferruginous, the basal joints black above, beneath yellow. Thorax slightly swollen, black, a curved line on each side in front, a dot before, and a narrow line beneath the wings, yellow; scutellum and post-scutellum dull red (sometimes black), parapsides distinct. Wings hyaline, ample, iridescent, radius and stigma pale testaceous, inclining to opaque-white. Legs: the anterior and medial coxæ and trochanters pale yellow, the extreme base black, posterior black, with their apices yellow; femora, tibiæ, and tarsi fulvous, clothed with a white pubescence. Abdomen black, all the segments, except the basal one, banded with fulvous-red, and margined with pale yellow, which colour grows more distinct towards the apex. Basal segment gradually narrowing towards the base, the centre elevated, a deep groove runs half the length from the middle to the base, enclosed by two sharply raised lines. Long. $7\frac{1}{2}$ mm. Caput et thorax = abdomen, $3\frac{1}{4}$ mm. Fem.

This species appears to come next to *M. amabilis*, Holmgren, Disp. Synop. Mesl. Scand., f. 19, and belongs to his sec. 3, div. 2, coh. 2 AA, bb, but differs in the colour of the coxæ and the transverse anal nervure being distinctly antefurcal. It appears to be widely and sparsely distributed, it has been taken by Mr. Bridgman, in the Norwich district, and by Mr. G. Bignell, near Plymouth, and I have taken two specimens near Exeter.

This insect varies a good deal in the colour of the abdomen.

Exeter: April, 1882.

RESULTS OF EXPERIMENTS IN REARING *TEPHROSIA CREPUSCULARIA* AND *BIUNDULARIA*, WITH REGARD TO VARIATION.

BY J. T. D. LLEWELYN, M.A., F.L.S.

Some years ago, Robert Stafford and I tried and published an experiment in rearing the dark smoke-coloured variety of *Tephrosia crepuscularia*, and I now offer a few remarks on a repetition of this experiment on this and another species of the same genus, viz., *T. biundularia*, in which the variation is still more pronounced and distinct.

Finding the variety of *crepuscularia* in a wild state, in a proportion of 5 per cent. to the type, we selected ova from a fine dark female moth, and, rearing them, were enabled to mate a dark pair, and thus obtain ova from two dark parents: in the next year we had a larger proportion of the dark smoky variety, and, repeating the selection of parentage, secured the union of darkly-bred dark parents, and thus, in 5 years of selected parentage, we were rewarded with a batch of 97 perfect insects of *Teph. crepuscularia*, all, without one solitary exception, of the dark smoky variation.

On a second trial of this same process, and in the third year of its satisfactory progress, we lost the whole lot from the ravages of the ichneumon flies, but nothing daunted, and favoured by circumstances, a fresh trial has this spring resulted thus. In the year, a batch of 250 insects hatched out from ova obtained from dark parents, but 20 have reverted to the original type.

In the case of *Tephrosia biundularia*, the variety is black, with the subterminal line clearly and conspicuously pencilled out in white, and this form of variation seems far more scarce with us than the corresponding form in *crepuscularia*. We have previously reared batches of this species, *crepuscularia*—both the spring and summer broods—but have only succeeded in obtaining a few specimens of the dark variation; last year, however, a dark female gave us a goodly batch of ova, and we are now hatching them out with the satisfactory result of having secured some twenty of this fine dark form; of these we have induced three pairs to mate, and have thus, at last, secured the wished-for darkly-bred ova.

I have used Doubleday's Nomenclature.

Will any of your correspondents kindly tell me if the other species of this genus are liable to similar variation?

I have plenty of the variety of *crepuscularia* in duplicate, should it be acceptable to your readers who would care to have it, but very few of *biundularia*.

Penllergare, Swansea:
April 12th, 1882.

RECTIFICATIONS CONCERNING *HOMOPTERA*.

BY JULES LICHTENSTEIN.

I. *Coccus lataniæ*, Boisduval (*Boisduvalia lataniæ*, Signoret), a very curious, round, brownish leaf-louse, fringed with a snow-white circle of fine secretion, and very common in hot-houses on all kinds of *Latania* and *Calami*, is neither a *Coccus* nor an *Aleurodes*, but a true Aphidian. The very scarce winged form looks entirely like the winged forms of the genus *Vacuna*, Heyden; it has the same forked neuration of the upper wings, and five-jointed antennæ all with fine circles. It is easily distinguished at once from the *Vacunæ* by the presence of two little conical-pointed horns between the antennæ under the forehead. I suggest for it the new generic name CERATAPHIS ("horned plant-louse"), and the species will become *Cerataphis lataniæ*, Boisduval.

II. *Coccus rubi*, Schrank, has not, according to Signoret, been re-discovered since the short description appeared in the "Fauna Boica." But I found the insect last autumn, and succeeded in breeding it. It lives in the larval state through the winter, sucking the under-side of the leaves of *Rubus discolor*. Early in spring the male larva forms a little cocoon in the same manner as in *Dactylopius*, and the imago makes its appearance in April. The female is an oval, purple-red scale-louse, fringed and spotted with snow-white woolly secretion, and has eight-jointed antennæ. The male is also purple-red, and has ten-jointed antennæ; wings and legs white; four snow-white tails or setæ, the interior pair as long as the entire insect, the exterior as long as the wings. This latter character induces me to term the genus "TETRURA," and the species will thus be *T. rubi*, Schrank.

Montpellier: 8th April, 1882.

Note on Aphalara nebulosa, Zett.—This species was originally introduced by me into the British list in my Monograph of the *Psyllidæ*, under the name of *A. radiata*, from specimens in the collection of the Rev. T. A. Marshall, which were taken at Cheltenham, as he informed me, either by beating or sweeping. In November, 1876, Dr. F. Löw sent me an example from the Imperial Museum of Vienna, desiring to know whether it was the same species as that described by me; but as he did not then give, nor has since given, me any clue as to what plant it was attached, I presume he has not been in a position to do so. Dr. O. M. Reuter, however, in the "Entomologisk Tidskrift" for 1881, p. 152, sp. 7, says that he has seen an example from Stockholm, on the ticket of which is "in *Epilobio angustifolio*," and as this, as well as other species of willow-herb, are not uncommon throughout this country, we appear to be now in a fair way to become acquainted with it. Nothing seems to be known of its earlier stages, so that a still greater inducement is in store for those who desire to be first in the field.—JOHN SCOTT, Lee, S.E.: March 6th, 1882.

Further note on Trioza crithmi.—The ink on the pages of the last part of the Magazine could have been barely dry when in answer to my enquiry, at page 263, I received a kind letter from Mr. P. H. Gosse, F.R.S., informing me that samphire grew in some profusion on Anstey's Cove Rocks, within a little distance from Torquay, and asking what the creature was like and when to be looked for. I at once replied, and have now the great gratification to say, that through his exertions I possess not only specimens of this species, but also the ova, larvæ, and nymph states. In fact, the whole biology of this valuable addition to the British fauna now lies before me in 4 glass bottles. I purpose describing the insect and its earlier stages afterwards, and will here only add that through all its transformations to the perfect state, it is uniformly of an orange-yellow colour. The eggs are set on long peduncles, and are easily seen. I believe that at Folkstone the plant is also very abundant, and as that place is much easier of access from here for pleasure seekers and others than is Devon, I may hear of the insect being also found there.—ID.: 16th April, 1882.

Additions to the Perthshire Hemiptera.—The following species of *Hemiptera* were captured at Pitlochry, and may be added to my former lists (vol. xvi, pp. 175 and 213).

Agalliaestes Wilkinsoni, two specimens with fully developed membrane, among short grass in woods; *Myrmedobia tenella*, *Teratocoris viridis*, moss, Knock Barril; *Nabis flavomarginatus*, Scholz, several developed specimens; *Pæciloscytus Gyllenhalii* with fully developed membrane; *Orthotylus fuscescens*, Kirschb., on pines; *Corixa carinata*, Sahlb., Loch Broom or its vicinity; *Trioza abdominalis*, Flor, on ivy; *T. galii*, Foerst., short grass, Faskally; *Doratura stylata*, Boh., Middlehaugh, July and August, many developed specimens; *Liburnia neglecta*, Flor; *L. elegantula*, Boh., Faskally; *L. denticauda*, Boh., Faskally; *L. uncinata*, Fieb., grass in woods; *L. mesomela*, fully developed; *L. discolor*, Boh., developed; *L. insignis*, Scott (Mr. Scott will describe this new species); *L. æmulatrix*, Scott; *L. distincta*, Flor, moss, Knock Barril; *L. forcipata*, Boh.; *L. notula*, Germ., Craigour; *Stiroma nasalis*, Boh.; *Dicranotropis hamata*, fully developed, in profusion; *Chlorita viridula*, Fall.; *Accephalus rivularis*; *A. polystolus*, Fieb., Middlehaugh; *Deltocephalus Minki*, on a dry hill, August; *D. socialis* var. *onustus*; *D. pseudocellaris*, Flor; *D. picturatus*, Fieb.; *D. Flori*, Fieb.; *Aphalara picta*, Craigour; *Thamnottetix frontalis*, H.-S., Culk; *Eupteryx abrotani*, Doug.; *Athysanus russeolus*, Fall.; *A. piceus*, Scott, in a marsh, Dunfallandy; *Eupelex spathulata*, *E. producta*, *E. cuspidata*, all common on a dry hill, Middlehaugh; *Orthezia cataphracta*, very abundant in the larval state; I bred two winged males and found others in September in profusion, sitting quietly on fine grass; *O. floccosa*, common in the larval state, with the above; *O. urticae*, rare, in the larval state. *Deltocephalus picturatus* and *Athysanus russeolus* are new to the British list.—G. NORMAN, Peebles: March 28th, 1882.

Abundance of Ptinella denticollis, Fairm.—Since writing my former note on *Ptinella denticollis* (Ent. Mo. Mag., vol. xvii, p. 186), I have taken every opportunity of searching for that minute beetle. Considering that (as the Rev. A. Matthews informed me) in 1881 there were not 40 specimens of this insect in all

collections put together, and also that up to that time this little beetle has been captured at the rate of only 1 or 2 specimens at a time, my success has been most remarkable.

Almost invariably, wherever I have searched for *P. denticollis* I have found it not in ones and twos, but in scores and hundreds. It is still plentiful in the locality in which I first found it (Knowle), and during the past winter and present spring it has occurred to me at the following amongst other places. In a bye-lane within three miles of the centre of Birmingham it is very plentiful under bark of oak stumps, posts, and rails; and in company with it I find *Euplectus nigricans*. At Sutton Park, seven miles from Birmingham, it literally swarms under the bark of dead oak trees. At Needwood Forest I captured a goodly number under the loose bark of decaying holly trees, and at Salford Priors and Bewdley Forest it occurred freely under bark on oak logs. It is very common under similar conditions at Leigh Woods near Bristol, and on a recent visit to Dean Forest I found several specimens (together with what I believe to be *P. britannica*) under bark on an old oak stump. It seems that comparatively few Coleopterists have met with *P. denticollis*, and the only conclusion I can arrive at is that owing probably to its minute size and its resemblance in colour to the bark under which it lives, it has been overlooked. Perhaps my note may have the effect of inducing other workers to look for this species; if so, and success attend their search, probably we shall soon see records of its capture from many other districts. I shall be pleased to send specimens to any Coleopterist in want of the species.—W. G. BLATCH, 214, Green Lane, Smallheath, near Birmingham: April 16th, 1882.

Early Coleoptera near Lincoln.—I have never been accustomed to get *Coleoptera* by sweeping much before May, certainly not in the North of England, but on March 18th, in a wood near Lincoln, I found beetles as abundant on the herbage as they often are in early summer. I swept *Lathrobium boreale* in some numbers, *Cytillus varius*, *Lema melanopa*, *Lathridius nodifer*, a *Cionus* or two, two or three species of *Halticidæ*, *Ceiliodes quercus*, two or three *Ceuthorrhynchi* (*C. punctiger* being the best), sundry *Staphylinidæ*, and a few common *Hemiptera*. *Atemeles emarginatus* was to be found in a nest of *Formica fusca*. *Coprophilus striatulus* is usually common on the Lincoln pavements in April; this year specimens were running about on March 19th.—W. W. FOWLER, Lincoln: April 15th, 1882.

Meloë variegata and other Coleoptera at Margate.—I have much pleasure in recording the occurrence at Margate of *Meloë variegata*, Don., of which rarity I obtained three specimens, during a visit in the early part of March last. Two of these were found by my sister, one sprawling upon the pathway, and the other upon the sands beneath, while I took the third myself upon a grassy bank not far from the town. Of *M. cicatricosa*, no less than six specimens turned up, four falling to my lot, and two to that of a friend who was with me for a couple of days. Among the more noteworthy of my remaining captures were the following:—*Dromius 4-signatus*, several under recently turned stones in a heap a mile or so from the town; *Bembidium 5-striatum*, two in the deserted burrows of sand hoppers in the cliff-cuttings; *Ocypus fuscatus*, one under a chalk lump upon the sands; *Saprinus maritimus*, *Rhinosimus viridipennis*, in profusion under bark in a small copse near

Kingsgate; *Trachyphlæus alternans*, *Tanymecus palliatus*, and *Mantura Matthewsii*, a single example of each; *Phyllotreta lepidii*, common by sweeping along the cliffs; *Cassida nobilis*, not uncommon under stones in the heap frequented by the *Dromius*; unfortunately I did not find it until the day before my departure, and therefore, failed to obtain more than fourteen specimens, all of which were clinging to the lower surfaces of the stones. Insect life in general appeared remarkably forward for the time of year, much more so than I found to be the case in this neighbourhood upon my return.—THEODORE WOOD, 5, Selwyn Terrace, Upper Norwood: April, 1882.

A marine Caddis-fly.—I have just received a letter from Prof. F. W. Hutton, of Canterbury College, New Zealand, in which is the startling announcement that the larva of a marine caddis-fly lives in Lyttleton Harbour in rock-pools between high and low water-marks, and forms its case of coralline seaweed. Prof. Hutton says he has kept the larvæ for months in jars of sea-water, but only once succeeded in breeding the insect, and that was when he was away from home, so that only the dead remains were obtainable. These (with larvæ and cases) are on their way to this country, and I am not a little curious as to what a creature of such anomalous habits can be like, for this is not an instance of a species occurring in "brackish" water, but absolutely marine.

Prof. Hutton also announces the breeding and forwarding of a New Zealand species of *Helicopsyche*.—R. McLACHLAN, Lewisham, S.E.: 11th April, 1882.

Dichrorhampha distinctana, Hein., a species of *Tortricidæ* new to Britain.—This very pretty species is allied to *plumbagana* and also slightly to *consortana*, it is of a rich dark brown mottled with silvery, and having the costal silvery streaks long and very oblique, the first united with the dorsal blotch, and the second connected by a sharp angle with the anterior edge of the ocellus, which is peculiarly formed, having a sharp angle in the middle of its anterior margin. The dorsal blotch extends two-thirds across the wing, is oblique, constricted above the middle, and has sinuous margins. There is a row of distinct black dots along the hind margin of the wing. Hind-wings pale grey, cilia of all the wings whitish with dark tips. Taken by Mr. R. South in a wood in North Devon among golden-rod (*Solidago virgaurea*).

It appears to be a very local species, being only recorded by Heinemann from bare hills near Vienna.—CHAS. G. BARRETT, Pembroke: 14th April, 1882.

Asthenia scopariana, H.-S., bred.—I have just had the pleasure of rearing a specimen of this pretty little Tortrix from a single larva sent me last year by Mr. Hodgkinson, feeding in flowers of *Genista tinctoria*. It arrived just too late to be described as it had just spun up in one of the flowers.—ID.

Obituary.

Charles Robert Darwin, LL.D., F.R.S., passed away, almost suddenly, at his residence at Down, Kent, on the 19th April, in his 74th year. Long before this brief announcement can be published, the daily and weekly journals in all parts of the world where Natural Science is cultivated will have given minute details of his life and

labours, and we have no hesitation in saying, that even his most unrelenting opponents will agree that we have lost the greatest Naturalist, the most painstaking and conscientious observer, and, privately, one of the most single-minded and kindest-hearted men of our times.

In the notices of his labours, full justice will have been given to his wonderful discoveries of the natural relations of plants and insects, in connection with the fertilization of the former. But it may, perhaps, not be so generally noticed, that during his celebrated voyage in the "Beagle," he collected a vast number of new and interesting insects; in *Coleoptera* alone his materials formed the subject of many memoirs by Mr. G. R. Waterhouse. Also it may not be so generally known, that he was one of the original Members of the Entomological Society of London, of whom only six now remain. He was with us long enough to see ridicule replaced by reasoning (often sufficiently lame) amongst his opponents. He was essentially a man who worked for the future; the Naturalists of to-day, painfully as they may feel the blow, cannot sufficiently realize the loss they have sustained.

ENTOMOLOGICAL SOCIETY OF LONDON: *February 1st, 1882.*—H. T. STAINTON, Esq., F.R.S., &c., President, in the Chair.

The President appointed Lord Walsingham and Messrs. Godman and Pascoe Vice-Presidents for the ensuing year,

R. Todd, Esq., of Bayswater, was elected a Member.

Mr. E. A. Fitch exhibited a very singular melanochroic variety of *Strenia clathrata* from Hampshire, in which the dark markings were confluent, so that only a few spots of the pale coloration remained; and a new Myrmecophilous Coleopterous insect, taken by Mr. Rothney in India.

Mr. C. O. Waterhouse exhibited *Macromela Balyi*, Crotch, one of the *Languiriidæ*, also from Mr. Rothney; also examples of a species of *Pentatomidæ* from the same source, involving a question as to distinct species, or only conditions depending upon degrees of maturity.

Sir S. S. Saunders exhibited both sexes of *Halticella osmicida*, Saunders, and read a note, in connection therewith, regarding *Euchalcis venusta*, Dufour.

Dr. Sharp communicated a critique of Dr. Horn's recent paper on the classification of the *Adephaga*, which occasioned a discussion, in which several Members took part.

Mr. A. G. Butler communicated a paper on additional *Lepidoptera* from the Hawaiian Islands, received from the Rev. T. Blackburn.

Professor Westwood communicated a Memoir on Fig-insects, with regard to caprification, &c.

March 1st, 1882.—The President in the Chair.

Mr. Billups exhibited examples of *Vespa germanica*, part of the congregation of this insect noticed by him in this Magazine, *ante* p. 234; in reply to a question he stated, that he believed all the specimens observed pertained to the same species, at all events, all those he brought home did so, *V. vulgaris* not being among them. He also exhibited a series of *Ichneumon erythræus*, a species hitherto considered to be extremely rare in this country. Likewise many specimens of *Callistus lunatus*, recently captured.

Mr. McLachlan, on behalf of Mr. P. H. Gosse, showed the envelopes in which a series of *Ornithoptera Haliphron*, &c., had been received from Celebes, and which bore the imprint of the insects defined with almost photographic accuracy. Mr. Gosse asked for suggestions as to cause, and the general opinion appeared to be that slight heating and pressure combined offered the most likely explanation. A subsequent analysis of the paper envelopes with regard to the possible presence of lead, made by Mr. Meldola, produced a negative result.

Mr. Meldola called attention to a paper by Mr. W. H. Edwards, recording the observations of Dr. Wettfeld on the habits of *Heliconius Charitonia*. The male butterflies appeared in swarms around the pupæ, and pairing took place before the females had emerged from the puparia, the males detecting the sex of the pupa immediately, and deserting those which were about to produce males. The Rev. W. Deans Cowan, present as a visitor, stated that he had made a quite analogous observation with regard to *Papilio Demoleus* in Madagascar.

Mr. C. O. Waterhouse read a description of the Indian Myrmecophilous Coleopterous insect exhibited at the last meeting, which he considered to form a new genus, and named *Paramellon sociale*.

Dr. Sharp, in communicating descriptions of some new forms of *Coleoptera* from New Zealand, entered into a lengthy, and very severe critique of Capt. Broun's "Manual of New Zealand *Coleoptera*."

Mr. A. G. Butler communicated a further portion of his paper on the *Lepidoptera* of Chili, collected by Mr. Edmonds (*Bombyces*).

Sir S. S. Saunders read a paper on the terminal segment of *Halticella*, with regard to M. André's published statement.

Mr. E. Saunders read a paper on the terminal ventral segments of *Prosopis* and other *Anthophila*.

April 5th.—The President in the Chair.

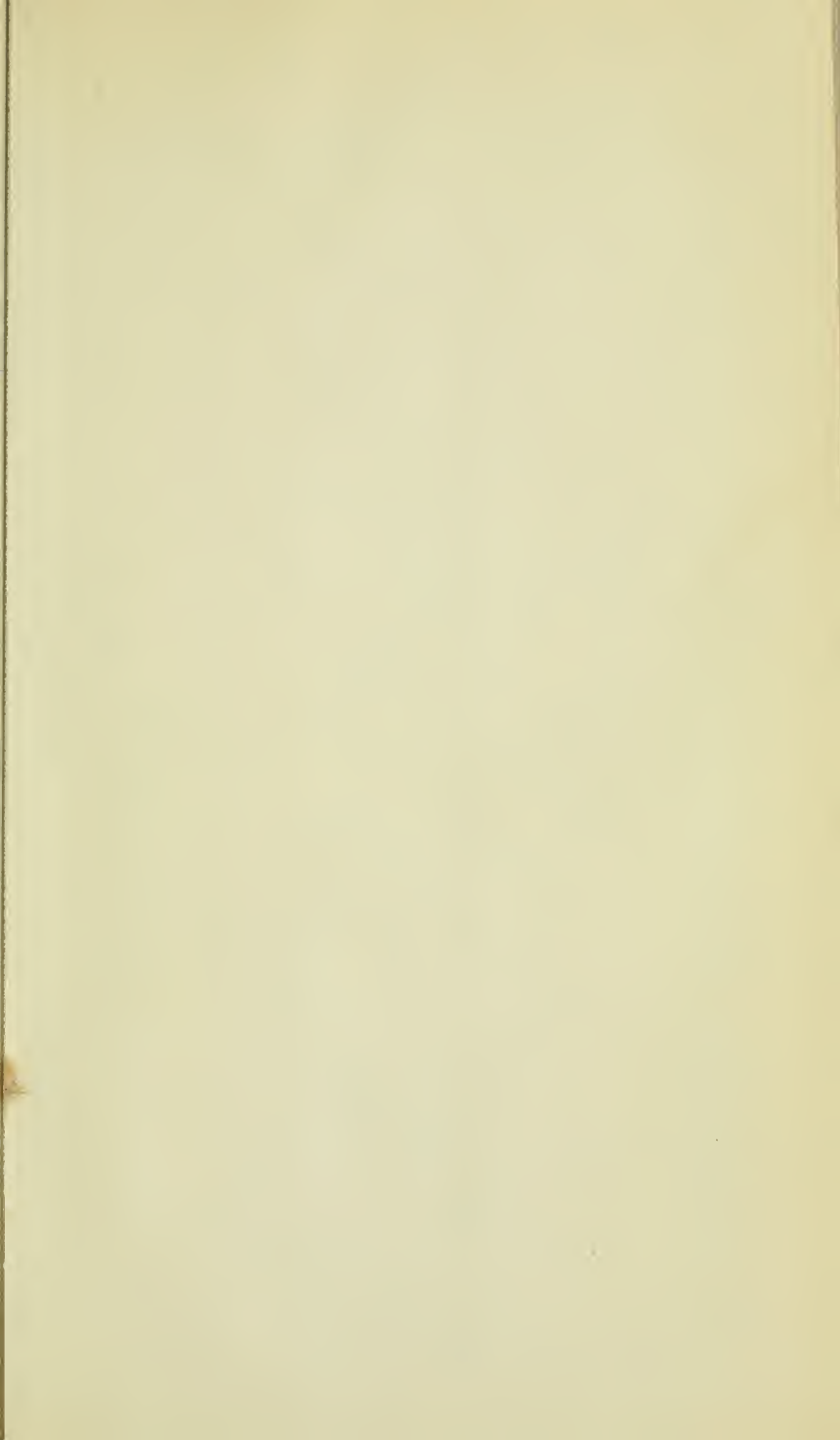
Mr. L. de Nicéville, of the Calcutta Museum, was elected a foreign Member.

Mr. Billups exhibited a number of small *Ichneumonidæ*, &c., mounted on discs of microscopic glass, thus enabling the upper and under-side of the same insect to be critically examined. The specimens were first mounted lightly on card, and subsequently transferred to the glass discs. The method appeared likely to prove of great service, the only drawback being the liability to breakage of the glass.

The Rev. H. S. Gorham exhibited a *Coccinella* sent to him by Mr. Hodgson, from Gloucestershire, which appeared to combine the characters of *C. ocellata* and *oblongopunctata*, and might possibly be a hybrid. He and Mr. Waterhouse stated it was an erroneous notion that *Coccinellidæ* are excessively variable, on the contrary, they are very constant in markings, save in two species, viz., *C. variabilis* and *C. bipunctata*.

Mr. McLachlan exhibited his collection of British Caddis-flies (*Trichoptera*), and made remarks on some of the more interesting forms, especially with regard to the cases. The collection had been more than 20 years in course of formation.

Mr. Butler continued his paper on the *Lepidoptera* of Chili (*Noctuæ*).



7. 1880

8. 1881-82

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 2025